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Ore Buying by Steel Companies

Less Business in Finished Lines—Large Sales of Copper at New Low Prices

The knot has been cut in the lake ore trade, releasing it from a position that was little short of paralysis. A Pittsburgh ore company has sold from its Mesaba mines 200,000 tons of Bessemer and 550,000 tons of non-Bessemer ores on a \$4.25 and \$3.50 basis respectively, or a reduction of 50 cents a ton from last year's prices. Cleveland firms have sold several blocks of ore at the same reduction, and with the price thus fixed various reservations made in the past few months become contracts.

Naturally the merchant furnaces will be slow to buy. Some of them have ore enough to carry them into the fall. Purchases thus far have been chiefly for steel companies and for furnaces affiliated with ore interests.

In the East considerable sales of Lake Champlain ores have already been made at 25 to 35 cents less than in 1910, but these ores, like those imported from Newfoundland and Europe, can still be delivered at eastern Pennsylvania furnaces at 1 to 2 cents a unit below the delivered price of lake ores.

The effect of the lower ore level is widely discussed. Pig iron, on any paper reckoning of costs, has been sold ex-ore reduction for some months. What remains to be seen is what sacrifice financial reasons may lead individual producers to make, if the iron market drags on with no new impetus. Temporarily pig iron buying, which has been growing less, may be put off to let the situation develop.

Two merchant furnaces in the Mahoning Valley have blown in, but several merchant furnaces in other districts are going out. The Carnegie Steel Company has put out four of its furnaces in the week, and the Steel Corporation's percentage of active furnaces has declined from 70 to 67.

There is continued weakness in open hearth billets in the Central West. While \$23, Pittsburgh, is the nominal basis, \$23, Cleveland, has been quoted.

Finishing mills in most lines are operating on reduced schedules, the output of the past week being the smallest in two months. With the falling off of new business, reports of irregularity in prices are more frequent, but these affect only a small proportion of the total business. In the main, co-operation continues, and the present scale of orders puts it under no great strain.

In steel bars, while the 1.40-cent basis is maintained, makers of hard steel bars have been more active, and as low as 1.27½ cents, Pittsburgh, has been quoted, while in Western markets bars rolled from bloom crop ends have been sold at concessions.

Export trade is quieter. The Steel Corporation's statement of earnings shows that an important percentage of its business in the first quarter was based on export prices.

Rail orders include 5000 tons for the B. & O., 5000

tons for the Reading, and 3000 tons for the Chicago, St. Paul, Minneapolis & Omaha. It is understood that the recent New Zealand business, 10,500 tons of 70-pound rails, came to this country.

The tonnage of new structural steel work has fallen off somewhat, and the smaller fabricators are getting less and less, prices having reached a prohibitive level for most of them. The Henry Corn building at Fifth avenue and Twelfth street, New York, 4000 tons, has been awarded, and at Philadelphia the Philadelphia & Western Electric Railroad has bought 2500 tons. For the elevated railroad extensions in New York, bids have gone in on 78,500 tons, of which 40,000 tons may not be let at present.

The week has made a record for the year in copper sales. The total has been estimated above 75,000,000 lb. It is known that several blocks of electrolytic sold at 117½c., but the bulk of the business was done at 12c. and the market has now stiffened at 12½c., New York.

Tariff Hysterics and Industry

A certain amount of hysteria may be counted upon as an accompaniment of Congressional proceedings for some time to come. Those to whom the dramatic appeals were no doubt much impressed in the closing of the debate on Canadian reciprocity last week by the performance of a member representing a Southern iron and steel district. Waving a telegram aloft, he announced that he had just received word from his constituents that construction work on a new wire plant in his district had been stopped and several hundred men had been thrown out of work because he favored the proposal to put a wire product on the free list. The member's declamatory defiance of such intimidation was rewarded with ample applause. It seemed not to occur to any one joining in the demonstration that when construction work on a new plant is finished, the services of the men engaged as builders are not required. It was more in line with the spirit of animosity which is being fanned in all public discussions of the tariff, to charge manufacturers with a menacing attitude.

There is also under way in the same Congressional district an important piece of engineering work which will provide an adequate water supply for a large steel plant. When the reservoir is completed, which the Tennessee Company has been building in accordance with plans widely published, there will be other hundreds of workmen whose services will be dispensed with. It may be also that a stretch of railroad track will be completed this spring in one of the Western States, and that several hundred track layers will thereupon be paid off. If the special session of Congress is prolonged until that time, we may look for another scene, with more spectacular declamation on the machinations of capital.

The performance of last Friday is notification that every slightest move in the business world in the next few months will be wrested into significance as a tariff factor. If business falls off, we shall be told that manufacturers are giving an advance object lesson in the fruits of tariff revision. And what might be called every day credulity under other conditions will be appealed to in perfect confidence by political leaders, for, with a Presidential election drawing on, politics must be allowed to do its perfect work, whatever becomes of sanity or business.

The Reduction in Lake Iron Ore

That a basis has been at last established for sales of Lake Superior ores in 1911 is almost as significant a fact as that a reduction of 50 cents a ton has been made from the prices of 1910. The season of navigation was opening with ore producers apparently as far from a decision as when the season of 1910 closed with ore stocks on dock and in blast furnace yards greater than had ever been known. Opposing views of the proper policy to be followed were urged so strongly that the ore trade seemed powerless to make a move. Consumers had been asking for weeks that the question be decided, arguing that continued uncertainty was hurtful. At the same time certain sellers favored delay, even on the eve of the sales made last week. Their hope was that time would bring some development pointing the way out of their dilemma. The buying movement in finished steel, that lasted for two months from the middle of January, gave some support to those who favored the old basis, but it diminished as April advanced. Leading steel interests, with no ore to sell, but with a natural desire to safeguard the finished steel market against further decline, exerted their influence in favor of the old schedule. They had done the same in 1908, when pig iron had dropped well below the level which was held to justify for 1907 the highest ore price since 1900. But the 1908 ore market broke under its own weight in June. Pig iron furnished the gauge then as now, in spite of a controlled market in finished material.

Merchant furnacemen, who buy all their ore in the market, have been divided in opinion. Some, who still have large piles of ore, have favored holding the old price. Others have been as insistent that new ore should sell at prices more in line with those for pig iron, as in the old days when the control of ore was less concentrated. Now that the 50-cent reduction has actually been made, it must be said that the new price really registers in a formal way what the pig iron market had already practically settled. Figuring coke at \$1.60, at oven, labor per ton of iron at \$1.25 and limestone per ton of iron at 60 cents, the cost of basic iron at Mahoning or Shenango Valley furnace comes out close to \$13.50 even on the new ore level, a showing that goes far toward answering the question whether the ore reduction means a further decline in pig iron. While the furnace company mining its own ore still has a margin on the dual operation, the experience of the past 12 months has left little relish for a continued telescoping of profits.

So much ore and pig iron are ahead of the blast furnacemen of the Central West that their ore buying this year will be on a very moderate scale. The iron mining companies, with reduced outputs and with wages on the high level of last year, while fixed charges per ton of ore will naturally increase, will find 1911 the least satisfactory year in a decade, barring only 1904 and 1905.

The Navy an Industrial School

The four experts in scientific management, Frederick W. Taylor, Henry L. Gantt, Charles P. Day and Harrington Emerson, who are studying the methods of the navy yards for the Federal Government, were present during the recent battle practice of the Atlantic battleship fleet, and expressed their opinion of the gen-

eral efficiency throughout the various departments of the vessels in the statement that they had not seen "anywhere in the world, either in an industrial plant or any other operation, anything that begins to equal the navy." Thousands of young men are receiving their training under these conditions. A large proportion of them have been given a preliminary education in government training schools, where the mechanical trades occupy an important place. The great majority of the boys are going out into the world to seek employment in industry. The leaven of a training in an environment of practically perfect efficiency, coupled with the discipline of naval life, should have an increasing influence in industrial work everywhere. In other words, the navy has become a great industrial school, the ultimate commercial results of which should be taken into account in considering the cost of the naval establishment. Some keen American observers have seen useful results of the military training of the German youth in their after life in the manufacturing plants of that country. If such is the case, the condition should be even more pronounced with the graduates of the American navy.

English and American Labor Conditions

A notable contribution to current economic literature is the report of the British Board of Trade, which has been investigating labor conditions in the United States for the purpose of making a comparison with those existing in England. The investigation appears to have been quite thorough and intelligent. It was confined to that section of the United States lying east of the Mississippi River and was conducted in 28 representative industrial towns and cities. The most important feature of the report is the comparison made as to wages, cost of living and margin of income above ordinary cost of subsistence.

To ascertain the level of wages, three generally distributed employments were selected, comprising the engineering, building and printing trades. The occupations selected in the engineering trades were those of fitters, turners, smiths, patternmakers and laborers. The occupations covered in the building trades were those of brick layers, stone masons, carpenters, plasterers, plumbers, painters and laborers. In the printing trade the wages of hand compositors on job work were taken as the basis. It was found that the hours of labor in most trades, with the exception of engineering, are shorter than in the United Kingdom, while the money earnings of the American workman are nearly two and one-third times as great as in England. The comparison of retail prices of food showed a considerably higher rate in the United States than in England. Put in concrete form, a British housewife could have purchased in February, 1909, for \$3.27, articles which would have cost an American housewife \$4.69, so that her weekly expense may be considered as less by \$1.42 per week than if she lived in the United States.

The conclusion derived from the figures secured is that while rent and food in America are dearer than in England, the higher rate of wages more than compensates for the difference. The margin of income in America is so large, when rent and food have been allowed for, that for those who desire to do so, and choose to exercise the necessary strength and will and foresight, saving is easier for the American than for

the British workman, because of the larger income at his disposal. No proof was offered that employment is more intermittent here than it is in Great Britain, and the result is seen in the higher standard of material comfort maintained by the American workman.

The investigation thus made is of vastly greater importance than those which have so frequently been conducted by American commissions of various kinds. It may be assumed that it was directed on thoroughly impartial lines, with no disposition whatever to lean toward the side of the American workman, as the British Board of Trade is a department of the government. It rather effectually disposes of the time-honored assertion that the cost of living is so much higher in the United States than abroad as to more than offset the higher rate of wages prevailing here.

The Alleged Structural Steel Dynamiters

Although the officers of the American Federation of Labor are quick to spring to the defense of the members of the International Association of Bridge and Structural Iron Workers who have been arrested on the charge of having caused the explosion in the *Times* Building in Los Angeles, October 1, 1910, the feeling of satisfaction is general that at last sufficient evidence has been secured to point definitely to somebody as guilty of that awful crime. The dynamiting of the *Times* Building was only one of a series of dynamite outrages that have occurred all over the United States. These outrages have usually been perpetrated in connection with structural steel work that had been erected by nonunion workmen. The inference was strong that this dastardly work was being conducted in a systematic manner by those who had special reasons for discouraging the employment of nonunion structural steel workers. The mere arrest of the parties mentioned in the daily newspapers is, of course, not proof that they are guilty of the crimes charged. Sufficient information has been given to the public, however, to make the presumption strong that the excellent detective work which has led to these arrests includes very damaging evidence of the guilt of the persons now in custody.

The Industrial Education Evangelist

The action of the National Metal Trades Association at its recent convention, in appropriating \$5000 toward the employment of an "evangelist," who will conduct a propaganda for the improvement and spread of industrial education, marks an important step in the progress of a great movement. While an excellent beginning has been made in the United States in establishing industrial schools, the surface has hardly been scratched, taking the country as a whole. This was demonstrated in the results of the investigation conducted by the Committee on Industrial Education of the association, as stated by its chairman, Fred A. Geier. From questions framed to find the existing status, only 136 out of 402 individual firms composing the membership made reply, and it was evident from the answers received that "the majority of the firms had not given the questions proper consideration, nor made any investigation of the conditions of industrial education in their respective communities." The replies further indicated that "there was apathy in those

communities where industrial education had not been advocated and introduced. In contrast to this, replies from such communities where industrial education had been studied and inaugurated showed the keenest interest in this subject and the greatest desire to see further development."

This whole matter is one of the uttermost importance in American industry. A dwindling apprentice system, taking the aggregate, coupled with a tremendously increased demand for skilled workmen, has made it imperative that the effort toward the training of boys in industrial schools be as universal as industry itself. The very small communities cannot support such schools, but the industries existing in these centers can establish courses of their own. The "evangelist," who will have to be a man of sagacity and trained ability, should do a great deal toward this general end.

United States Steel Corporation's Earnings

The statement of the United States Steel Corporation's earnings for the quarter ended March 31, 1911, makes the following showing, as compared with the corresponding period of 1910:

	1911.	1910.
January	\$5,869,416	\$11,316,014
February	7,180,928	11,616,861
March	10,468,859	14,684,001
Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants, and interest on bonds and fixed charges of the subsidiary companies.....	\$23,519,203	\$37,616,876
Less charges and appropriations for the following purposes:		
Sinking funds on bonds of subsidiary companies and depreciation and replacement funds.....	3,517,386	6,113,682
Net earnings.....	\$20,001,817	\$31,503,194
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	\$5,810,794	\$5,876,612
Sinking funds for the quarter on U. S. Steel Corporation bonds:		
Installments	1,012,500	1,012,500
Interest on bonds in sinking funds	488,668	422,851
	\$7,311,962	\$7,311,963
Balance.....	\$12,689,855	\$24,191,231
Dividends for the quarter:		
Preferred, 1½ per cent.....	\$6,304,919	\$6,304,919
Common, 1½ per cent.....	6,353,781	6,353,781
Surplus for the quarter.....	\$12,658,700	\$11,532,531
Appropriated for new plants, construction, &c.....		5,000,000
Balance of surplus for the quarter	\$31,155	\$6,532,531
	Tons.	Tons.
Unfilled orders on hand, March 31...	3,447,301	5,402,514

The net earnings for the quarter ended December 31, 1910, were \$25,990,978, and the surplus carried over for the quarter was \$408,032.

The American Gröndal Kjellin Company, 45 Wall street, New York, has changed its name to the American Gröndal Company. Announcement is made that the company has added to its engineering force men who have made a special study of various methods of treating iron ores. It has a testing plant in which it makes commercial tests on ores submitted and determines the proper method of treating the ore, whether by concentration and briquetting or otherwise.

Frank Millner, Inc., iron and steel scrap merchant, Trenton, N. J., has materially increased its facilities at its yard at Florence, N. J., which now covers from four to five acres. Additional railroad trackage has been laid and the capacity of the yard trebled.

The General Electric Company's Annual Report

The General Electric Company's report for the year ending December 31, 1910, gives the following income account, as compared with the previous year:

	1910.	1909.
Total receipts.....	\$74,707,689	\$54,102,051
Manufacturing costs, interest, depreciation, &c.....	63,841,996	47,608,389
Net profits.....	\$10,855,692	\$6,493,670
Dividends	5,214,368	5,214,352
Balance.....	\$5,641,324	\$1,279,319
Previous surplus.....	17,381,381	16,102,062
Total surplus.....	\$23,022,706	\$17,381,381

The balance sheet as of December 31 compares as follows:

Assets.	1910.	1909.
Patents, &c.....	\$1	\$1
Factory plants.....	15,516,314	14,330,958
Real estate.....	245,719	118,063
Stocks and bonds.....	23,666,883	22,329,063
Accounts and notes receivable.....	19,047,459	19,377,972
Inventories	27,796,276	25,150,035
Work in progress.....	589,788	462,223
Cash	14,912,400	17,623,466
Copper mining investment.....	2,805,077	3,408,604
Due from allied companies.....	2,923,483	.....
Totals	\$107,767,017	\$102,440,988
Liabilities.		
Stock	\$65,179,600	\$65,179,600
Debentures	14,962,000	14,962,000
Accrued interest.....	83,664	83,664
Accounts payable.....	2,796,230	2,753,617
Uncollected dividends.....	1,303,592	1,303,592
Profit and loss surplus.....	23,022,706	17,381,381
Advance payments.....	245,819	777,133
Accrued taxes.....	173,405	.....
Totals	\$107,767,017	\$102,440,988

Vice-President J. R. Lovejoy remarks in part as follows: "Sales billed and orders received during the past year were the largest for any year since the organization of the company. The orders exceeded those received in the year ended January 31, 1907, the largest previous year, by 17.7 per cent., and were 105 per cent. greater than for the year ending January 31, 1905. The yearly rate of orders was substantially uniform for each quarterly period, increasing slightly during the last quarter. The total number of orders and contracts received during the year was 338,272—exceeding all previous records. The increased business this year came largely from our many thousand established customers in small contracts and current orders, rather than from new enterprises requiring large amounts of electrical apparatus. Unfilled orders as of December 31, 1910, amounted to \$15,500,000. The business of our foreign department was larger than for any previous year. We are constantly establishing new relations and seeking new outlets for our product."

Vice-President Rice says in part: "Expenditures for building and extension and other additional equipment during 1910 amounted to \$5,846,531. About one-third of these expenditures were applied to enlargement of productive capacity. On December 31 the company had 8,530,000 sq. ft. of floor space and 32,000 employees. The total land area of the works is 608 acres. In 1907 we purchased a large tract of land in Erie, Pa., and during the past year considerable grading work has been done preparing the site for manufacturing. A large iron foundry, pattern shop and machine shop are now under construction."

The company has \$2,805,076 invested in copper mining, of which \$1,129,961 represents capital stock and \$1,675,115 advances, largely to the Bully Hill Copper Mining Company.

The V & O Press Company, Glendale, Long Island, N. Y., announces the establishment of a new Chicago agency. Hereafter the company will be exclusively represented in Chicago territory by Hill, Clarke & Co., who carry a full line of presses in stock, and in addition have a fully equipped demonstration shop where V & O presses, as well as other machinery, may be seen in operation.

The Question of Extras in the Eastern Jobbing Trade

Some conferences have been held recently between iron and steel jobbers in Eastern territory and the manufacturers of bars and other products, such as have been sold from the Waverly, N. J., warehouse of the Carnegie Steel Company in the past two or three years. One of the questions involved has been the maintenance of full extras on sizes of bars carrying extras, in sales made to the trade ordinarily supplied by jobbers. One steel company sells on a card, the printed extras of which are half the extras of the card on which the jobbers sell. Other manufacturers have used the same card as the jobbers, showing full extras. In the New York district particularly the jobbing trade has found it difficult to secure these full extras, which it is contended a jobber must charge to get a living profit on bar business. A compromise proposal has been discussed providing that warehouse sales be made on a net card on which the extras should be three-fourths of the full extras. This has met with some favor among jobbers in the New York district, but is not so regarded by the jobbing trade in Philadelphia and Boston. The chief objection is that there would be added confusion, since the compromise card would not lead to the elimination of either the half-extra or the full-extra cards. There has been no adjustment as yet of the questions involved, but a sentiment has developed in favor of a more satisfactory footing for the jobbing trade.

Pacific Coast Metal Trades Convention

The fifth annual convention of the United Metal Trades Association of the Pacific Coast, held in Tacoma, Wash., April 14 and 15, was highly successful. Representatives were present from Los Angeles, San Francisco, Portland, Spokane, Tacoma, Seattle, Everett, Bellingham and Vancouver to the number of about 100. The reports of the retiring officers showed that the past year was the most prosperous the association has known. Three new districts were created: the Inland Empire district, the British Columbia district and the district in California. The following officers were elected for the coming year: President, H. T. Clarke, Portland Iron Works, Portland, Ore.; first vice-president, John Hartman, Atlas Foundry & Machine Company, Tacoma, Wash.; second vice-president, F. G. Frink, Washington Iron Works, Seattle, Wash.; third vice-president, J. M. Fitzpatrick, Union Iron Works, Spokane, Wash.; treasurer, A. M. Clark, Columbia Steel Company, Portland, Ore. Saturday afternoon, through the courtesy of the Tacoma members, the delegates were taken over the city and to the Country Club and the smelter. Saturday evening a banquet was held, attended by 88 persons.

The Universal Vanadium Company has been formed for the purpose of acting as selling agent throughout the world for ferrovanadium manufactured by the American Vanadium Company, Pittsburgh, Pa., and will act in conjunction with the Vanadium Sales Company of America. It has been incorporated under the laws of Delaware. The directors and officers are as follows: Edward M. McIlvain, president, 30 Church street, New York; Col. Millard Hunsiker, vice-president, 23 Rue De La Paix, Paris, France; James C. Gray, secretary and treasurer, Frick Building, Pittsburgh, Pa.; Joseph W. De Wyckoff, European representative, 64 Victoria street, Westminster, London, England; E. Marshall Fox, Wetley Rocks, Staffordshire, England; Sylvester D. Townsend, Jr., Wilmington, Del.; William McIlvain, Reading, Pa.

The Singer Mfg. Company, says the *Wall Street Journal*, controls approximately 80 per cent. of the world's output of sewing machines. Over 2,000,000 machines of 1000 different types per annum are now being turned out by the company's nine factories, which employ 28,000 operatives. Two of these factories are in the United States, at Elizabethport, N. J., and Bridgeport, Conn. In

Canada a large plant has recently been completed at St. John. The largest sewing machine factory in the world is operated near Glasgow, Scotland, while other plants are situated at Wittenberg, Saxony; Berlin, Prussia, and Podolsk, Russia.

The Donnelly-McArdle Case

Another stage has been reached in the now famous 20-year lawsuit, in which Michael Donnelly, 247 West Fifteenth street, New York, and Patrick J. McArdle, Albany, N. Y., brothers-in-law, are the contestants. In the 80's, when Donnelly was engaged in the scrap iron business in New York and McArdle in Albany, they became partners. In 1889, to tide over financial troubles of the firm, Donnelly transferred his interest in the business to McArdle for a consideration of \$1, to protect the latter in case the firm was found to be insolvent. According to Donnelly, the bill of sale was to be void and half the net proceeds of the firm's assets, the total being about \$158,000, was to be paid over to him if investigation proved the firm to be solvent. McArdle, however, contended that the document was an absolute bill of sale, and that Donnelly had no further interest in the business or its assets. Donnelly was thus forced to begin action to recover the interest in the firm's business claimed by him. The litigation has been almost a continuous proceeding since then.

The last decision in the case was rendered last week by a referee, to whom had at length been given the duty of fixing Donnelly's equity in the partnership. The referee's report gives Donnelly's share at \$41,000, which, with costs and extra allowances, makes his total about \$60,000. This is not satisfactory to Donnelly, who claims that the referee disallowed improperly items totalling \$567,131. Up to this time there have been seven trials in this case, taking 97 trial days, employing 93 lawyers, involving 40 judges and 249 witnesses, costing Donnelly \$163,500 in counsel fees and McArdle about \$200,000.

The Itabira Iron Mines in Brazil

In the published details concerning the iron ore deposits of Concelcao Sant Anna and Cauê, near the town of Itabira in the Province of Minas Geraes, Brazil, it has been stated that these properties were in the hands of the B. H. Syndicate, Ltd. The *London Iron and Coal Trades Review* says that "the Itabira Iron Ore Company, Ltd., has just been registered to adopt an agreement with the B. H. Syndicate, Ltd., as well as the agreements by that syndicate with the Companhia do Porto da Victoria, and the Companhia E. F. Victoria à Minas." The capital of the company is given at £2,000,000 sterling, in £1,500,000 ordinary and £500,000 preference shares of £1 each. No public issue has been made. The board embraces J. W. Beaumont Pease, Newcastle-on-Tyne; Col. J. R. Wright, Swansea; Walter McLaren, M.P.; F. Samuelson, Middlesbrough; I. Hamilton Benn, M.P., and Austin Harris and T. H. C. Levick of Harris & Dixon, Ltd. Through its directors and shareholders the company is associated with a strong group of iron and steel masters, as well as having considerable financial backing. A number of iron ore properties in Brazil are at present on the market, and the success of the Itabira Iron Ore Company may bring on a boom in Brazilian iron ore lands, though it is predicted that it will be some years before the deposits in the western part of the State of Minas can be exploited. The Itabira Company will build its own railroad to Port Victoria, where a dock 850 ft. long will be built, according to a recent Brazilian decree. There will be 28 ft. of water alongside dock.

The Philadelphia & Western Railway Company, Philadelphia, Pa., has awarded a contract to the Keystone State Construction Company, of that city, for the construction of a two-track line between Villanova and Bridgeport. The same company has awarded a contract for highway and railroad bridges, including one over the Schuylkill River, to the Pennsylvania Steel Company, requiring about 3000 tons of material.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

	Apr. 26, 1911.	Apr. 19, 1911.	Mar. 22, 1911.	Apr. 27, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia.....	\$15.50	\$15.50	\$15.50	\$17.50
Foundry No. 2, Valley furnace.....	13.75	13.75	13.75	15.50
Foundry No. 2, Southern, Cincinnati.....	14.25	14.25	14.25	15.25
Foundry No. 2, Birmingham, Ala.....	11.00	11.00	11.00	12.00
Foundry No. 2, local, Chicago*.....	15.00	15.00	15.50	17.25
Basic, delivered, eastern Pa.....	15.00	15.25	15.25	17.50
Basic, Valley furnace.....	13.75	13.75	13.75	15.75
Bessemer, Pittsburgh.....	15.90	15.90	15.90	17.90
Gray forge, Pittsburgh.....	14.40	14.40	14.40	15.90
Lake Superior charcoal, Chicago.....	17.50	17.50	17.50	19.00

COKE, CONNELLSVILLE,

Per Net Ton, at oven:				
Furnace coke, prompt shipment.....	1.55	1.60	1.55	1.70
Furnace coke, future delivery.....	1.75	1.75	1.75	1.90
Foundry coke, prompt shipment.....	2.00	2.00	2.00	2.25
Foundry coke, future delivery.....	2.20	2.25	2.25	2.40

BILLETS, &c., Per Gross Ton:

Bessemer billets, Pittsburgh.....	23.00	23.00	23.00	20.50
Forging billets, Pittsburgh.....	28.00	28.00	28.00	32.00
Open hearth billets, Philadelphia.....	25.40	25.40	25.40	30.00
Wire rods, Pittsburgh.....	29.00	29.00	29.00	32.00

OLD MATERIAL, Per Gross Ton:

Iron rails, Chicago.....	14.25	14.50	14.50	18.50
Iron rails, Philadelphia.....	17.00	17.50	18.50	20.50
Car wheels, Chicago.....	13.25	13.25	13.25	16.00
Car wheels, Philadelphia.....	13.00	13.25	14.00	15.50
Heavy steel scrap, Pittsburgh.....	12.50	12.75	14.00	15.75
Heavy steel scrap, Chicago.....	11.50	11.50	12.00	14.25
Heavy steel scrap, Philadelphia.....	13.00	13.25	14.00	15.75

FINISHED IRON AND STEEL,

Per Pound:				
Bessemer rails, heavy, at mill.....	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia.....	1.35 1/2	1.35	1.37 1/2	1.50
Common iron bars, Chicago.....	1.25	1.25	1.27 1/2	1.60
Common iron bars, Pittsburgh.....	1.35	1.35	1.35	1.61
Steel bars, tidewater, New York.....	1.56	1.56	1.56	1.45
Steel bars, Pittsburgh.....	1.40	1.40	1.40	1.71
Tank plates, tidewater, New York.....	1.56	1.56	1.56	1.55
Tank plates, Pittsburgh.....	1.40	1.40	1.40	1.66
Beams, tidewater, New York.....	1.56	1.56	1.56	1.50
Beams, Pittsburgh.....	1.40	1.40	1.40	1.66
Angles, tidewater, New York.....	1.56	1.56	1.56	1.50
Angles, Pittsburgh.....	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh.....	1.30	1.30	1.30	1.60
Skelp, sheared steel, Pittsburgh.....	1.35	1.35	1.35	...

SHEETS, NAILS AND WIRE,

Per Pound:				
Sheets, black, No. 28, Pittsburgh.....	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh.....	1.80	1.80	1.80	1.85
Cut nails, Pittsburgh.....	1.65	1.70	1.70	1.85
Barb wire, galv., Pittsburgh.....	2.10	2.10	2.10	2.15

METALS, Per Pound:

Lake copper, New York.....	12.37 1/2	12.37 1/2	12.50	13.25
Electrolytic copper, New York.....	12.12 1/2	12.12 1/2	12.25	12.75
Spelter, New York.....	5.50	5.50	5.65	5.60
Spelter, St. Louis.....	5.30	5.30	5.50	5.45
Lead, New York.....	4.42 1/2	4.45	4.40	4.40
Lead, St. Louis.....	4.27 1/2	4.30	4.25	4.25
Tin, New York.....	42.50	41.70	40.50	32.90
Antimony, Hallett, New York.....	9.00	8.75	9.12 1/2	8.25
Tin plate, 100-lb. box, New York.....	\$3.94	\$3.94	\$3.94	\$3.84

* This price is at furnace and not delivered in Chicago.

† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22 1/2c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on steels, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, 1/4 in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than 1/4 in. thick, 1.45c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in.

and up, 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, 1/4 in. thick, 6 1/4 in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, 1/4 in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered 1/4 in. plates. Plates over 72 in. wide must be ordered 1/4 in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under 1/4 in. to and including 3-16 in. on thinnest edge.....	\$0.10
Gauges under 3-16 in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including all straight taper plates), 3 ft. and over in length.....	.10
Complete circles, 3 ft. in diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive.....	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive.....	.50
Cutting to lengths or diameters under 1 ft.....	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, \$1.55 per square. Galvanized sheets, No. 28, \$2.75 per square for 2 1/2-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Butt Weld.		Iron.	
	Steel.	Black. Galv.	Black. Galv.	
1 to 1 1/2 in.....	75	63	71	59
1 1/2 in.....	75	69	75	65
2 to 3 in.....	80	70	76	66
Lap Weld.				
2 in.....	76	66	72	62
2 1/2 to 4 in.....	78	68	74	64
4 1/2 to 6 in.....	77	67	73	63
7 to 12 in.....	75	59	71	55
13 to 15 in.....	51 1/2	..	..	..
Butt Weld, extra strong, plain ends, card weight.				
1 1/2 in.....	69	59	65	55
1 1/2 in.....	74	68	70	64
2 to 1 1/2 in.....	78	72	74	68
2 to 3 in.....	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.....	75	69	71	65
2 1/2 to 4 in.....	77	71	73	67
4 1/2 to 6 in.....	76	70	72	66
7 to 8 in.....	69	59	65	55
9 to 12 in.....	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
1 1/2 in.....	64	58	60	54
2 to 1 1/2 in.....	67	61	63	57
2 to 3 in.....	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.....	65	59	61	55
2 1/2 to 4 in.....	67	61	63	57
4 1/2 to 6 in.....	66	60	62	56
7 to 8 in.....	59	49	55	45

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Plugged and Reamed.
1 to 1½, 2 to 3 in. Butt Weld Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe. Butt or Lap Weld as specified.
2, 2½ to 4 in. Lap Weld
The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are now as follows:

	Steel.
1½ to 2¼ in.	65
2½ in.	67½
2½ to 3¼ in.	70
3½ to 4½ in.	71½
5 and 6 in.	65
7 to 13 in.	62½

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, \$29. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed \$1.60, galvanized \$1.90; carload lots, to retailers, annealed \$1.65, galvanized \$1.95. Galvanized barb wire, to jobbers, \$2.10; painted, \$1.80. Wire nails, to jobbers, \$1.80.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.									
Nos.	0 to 9	10	11	12	12½	13	14	15	16
Annealed	\$1.75	1.80	1.85	1.90	2.00	2.10	2.20	2.30	2.30
Galvanized	2.05	2.10	2.15	2.20	2.30	2.40	2.50	2.60	2.90

Market and Stone Wire in Bundles, Discount from Standard List.

Bright and Annealed:	
9 and coarser	.80
10 to 18	.80 and 10
19 to 26	.80 and 10 and 2½
27 to 36	.80 and 5
Galvanized:	
9 and coarser	.75 and 10
10 to 16	.75 and 10
17 to 26	.72½ and 10
27 to 36	.72½
Coppered or Liquor Finished:	
9 and coarser	.75 and 10
10 to 26	.75 and 10
27 to 36	.70 and 10 and 5
Tinned:	
6 to 18	.75 and 10 and 10

Pittsburgh

PARK BUILDING, April 26, 1911.—(By Telegraph.)

Pig Iron.—The only inquiry of note in the market is for 900 tons of straight No. 2 foundry iron from a radiator interest at Johnstown, Pa. The iron will likely be bought from a nearby furnace, which has a lower freight rate than the Valley furnaces. Consumers of Bessemer and basic, while not badly in need of iron, are nevertheless holding off to see the effect of the reduction of 50c. a ton in the price of Lake ore. Considerable doubt is expressed as to whether present prices on pig iron can be maintained, in the face of the lack of demand and the heavy production. It is therefore believed that the market is likely to remain quiet for some time. Prices, which are regarded as nominal, are as follows: Bessemer pig iron, \$15; malleable Bessemer, \$13.75; basic, \$13.75 to \$14; No. 2 foundry, \$13.75 to \$14, and gray forge, \$13.50, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—There is decided weakness in the steel market, especially on open hearth billets, which have been offered at \$23, delivered in Cleveland. Prices on Bessemer steel continue fairly strong, but specifications from consumers of billets and sheet and tin bars have fallen off very materially, especially on billets. The larger steel mills are still quoting regular prices, which they claim they are holding firmly, as follows: Bessemer and open hearth billets, 4 x 4 in. and up to, but not including, 10 x 10 in., at \$23, base, and sheet and tin bars in 30-ft. lengths, \$24; 1½-in. billets, \$24; forging billets, \$23, base, usual extras for sizes and carbons—all prices f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(By Mail.)

The reduction in ore prices for 1911 delivery is the live topic in the iron trade at present. The break came last week when W. P. Snyder & Co. sold 750,000 tons of ore to six interests, all steel companies but one. Of this amount 200,000 tons was Mesaba Bessemer, at \$4.25 for base ore containing 55 per cent. iron (natural state), and the remainder was non-Bessemer Mesaba at \$3.50 for the base ore, containing 51.50 per cent. iron (natural state). These prices are 50 cents per ton less than 1910 prices, and are the same as were in force in 1908 and 1909. Opinions differ as to the effect the reduction will have on prices of

pig iron. Furnacemen claim that lower ore prices have been discounted in the low prices that have been ruling for pig iron for some months. Consumers, however, do not take this view. The demand for pig iron has not been stimulated so far, consumers still holding off. The output of pig iron is again being curtailed. The Carnegie Steel Company has recently blown out one Edgar Thomson furnace, one Bellaire, one Isabella and one at Youngstown, and will blow out three or four more in the next week or so. The Youngstown Sheet & Tube Company has put out its furnace A for relining. On the other hand, Tod of Youngstown Steel Company and Mary of Ohio Iron & Steel Company have been started. The Pittsburgh Steel Company, which has been getting a part of its basic iron from the Canal Dover furnace of M. A. Hanna & Co., has transferred this business to the Shenango Furnace Company, and is now getting its entire requirements of basic iron from the latter interest. The Bessemer Pig Iron Association reports that it has not made a sale of Bessemer iron for several months, but is holding at \$15, Valley. The new demand for steel is dull, and some of the smaller open hearth plants continue to shade regular prices. Specifications against sheet and tin plate contracts have slowed down materially. Current new business in finished iron and steel is light, and reports are that concessions in prices are being made more frequently, especially in sheets. The market on tin plate is not so firm as it was some time ago. A surprising development is the slowing down in new orders and specifications in the wire trade, April having shown a large falling off as compared with March. The new wire and wire nail mills of the Cambria Steel Company, Johnstown, Pa., have started, and will add considerably to the supply. Coke is extremely quiet. Scrap is pretty badly demoralized, heavy steel scrap having sold at \$12.50, a record low price. All indications point to a further slowing down in operations among the blast furnaces and mills, until more business is being offered.

Ferromanganese.—An inquiry is in the market for 300 tons for third quarter delivery, and we note a sale of about 100 tons for May and June at \$36.50, Baltimore. We quote 80 per cent. foreign at \$36.50 to \$36.75, Baltimore, the rate for delivery in the Pittsburgh district being \$1.95 a ton.

Ferrosilicon.—New demand is very quiet. We quote 50 per cent. at \$53 to \$53.50, f.o.b., Pittsburgh, for delivery through the third quarter; 10 per cent. blast furnace silicon, \$23; 11 per cent., \$24, and 12 per cent., \$25, f.o.b. cars, Jisco and Ashland furnaces.

Muck Bar.—With no recent sales reported, we continue to quote best grades of muck bar made from all pig iron at nominally \$29, Pittsburgh. The Wilkes Rolling Mill Company, Sharon, Pa., started up its muck bar mill on Monday; it had been shut down for several weeks.

Skelp.—The market is quiet, consumers being covered for some time ahead and not specifying freely against their contracts. Prices continue fairly strong and we quote: Grooved steel skelp, 1.30c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers mills in the Pittsburgh district, usual terms.

Wire Rods.—As most consumers are covered to July 1 on contracts placed some time ago, the new demand is light. Specifications are not coming in fast. The Cambria Steel Company will now consume in its wire mills a good part of the output of its rod mill. We quote Bessemer, open hearth and chain rods, ordinary carbons, at \$29, Pittsburgh.

Steel Rails.—In the past week the Carnegie Steel Company booked two contracts for standard section rails of 5000 tons each and one for 500 tons. New demand and specifications for light rails have been rather quiet, the same company taking about 1200 tons. It is also receiving some fairly large orders for both light rails and standard sections for export. Prices on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b., at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per pound.

Structural Material.—The McClintic-Marshall Construction Company has taken 1100 tons for new steel buildings for the Union Steel Casting Company in this city and 500 tons for a sugar factory at New Orleans, La. The Henry W. Oliver Estate has a project under way for the building of a large hotel on Sixth avenue and Smithfield street in this city, the plans for which have been drawn by F. M. Andrews & Co., architects, New York, and it is probable that bids on the steel, 6000 to 8000 tons, will be asked for in a short time. There is still much complaint about the very low prices that are being made on fabricated work, one prominent structural company stating that on a number of recent jobs placed the prices were below actual cost to this concern, which is a leading one in the trade. Headway is being made on plans for the formation of an

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association of steel fabricators. We continue to quote beams and channels up to 15 in. at 1.40c., Pittsburgh.

Plates.—New orders for cars continue light, but some fairly large inquiries are out. The Western Maryland Railroad has placed 500 composite steel cars with the Standard Steel Car Company, the plates and shapes, 5000 to 6000 tons, to be rolled by the Carnegie Steel Company. The Norfolk & Western Railroad will build 250 steel cars at its shops at Roanoke, Va., and has divided the material between the Portsmouth Steel Company, Portsmouth, Ohio, and the Carnegie Steel Company. The Chicago, Burlington & Quincy is in the market for 1000 cars and the Seaboard Air Line for 1000 cars. The Pressed Steel Car Company is making some extensive improvements to its car shops at Woods Run, which will somewhat increase the capacity of this plant. The general demand for plates from boiler shops and other consumers is quiet, and it is estimated that not more than 60 per cent. of plate capacity, if that much, is active at present. We quote $\frac{3}{4}$ -in. and heavier plates in the wide sizes at 1.40c., but on the narrower sizes it is stated that a few mills are slightly shading this price.

Sheets.—The general condition of the sheet trade is rather unsatisfactory, new demand being dull, while specifications against contracts are not active. There is also more or less cutting in prices, particularly in West Virginia and some other districts. The American Sheet & Tin Plate Company is operating to slightly less than 60 per cent. of the sheet capacity, and as a rule the independent mills are running on about the same basis. Regular prices on black, galvanized and roofing sheets are printed on a previous page.

Tin Plate.—The new demand for tin plate continues very quiet, and specifications against contracts so far this month have shown a sharp falling off as compared with the same period in March. There has been a gradual but material slowing down in operations among the tin plate mills, and at present not more than 75 per cent. of capacity, and possibly less, is active. We continue to quote 100 lb. coke plates at \$3.70 per base box, f.o.b. Pittsburgh.

Bars.—The steel bar and bar iron trades continue very quiet, only a small amount of new business being placed, while specifications against contracts have not been as good this month as in March. Indications for the near future are not very bright. All the mills rolling iron and steel bars are short of work. While the tone of the market is weaker, prices on steel bars are reported as being fairly well maintained, but on iron bars are slightly lower. We continue to quote steel bars at 1.40c. and common iron bars at 1.35c., Pittsburgh, but on a nice specification our price on iron bars might be shaded.

Shafting.—This trade has been very dull this month, very little new business being placed, while specifications against contracts are unsatisfactory. Discounts on cold rolled shafting are 57 per cent. on carloads and 52 per cent. in less than carloads, delivered in base territory, but these discounts are more or less flexible.

Spelter.—The new demand is light; but smelters are able to maintain prices fairly well by restricting output. We quote prime grades of Western at 5.30c., East St. Louis, equal to 5.42 $\frac{1}{2}$ c., Pittsburgh.

Hoops and Bands.—Specifications against contracts are not coming in well and the new demand continues quiet. From some sections specifications are fair, but from other places are being held up. We quote steel hoops at 1.45c. and bands at 1.40c., with extras on the latter as per steel bar card.

Merchant Steel.—Business entered by the mills so far this month shows a falling off as compared with March. Jobbers and consumers are placing only small orders to cover actual needs. We quote the higher grades of merchant steels, f.o.b. Pittsburgh, as follows: Iron finished tire, $\frac{1}{2}$ x $1\frac{1}{2}$ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—A meeting of the rivet makers was held in New York last week, at which the regular prices of 1.90c. on structural rivets and 2c. on boiler rivets were reaffirmed. These prices, however, are not being observed, structural rivets being quoted as low as 1.75c. and boiler rivets 1.85c. Some makers refuse to go below these prices.

Wire Products.—New demand and specifications against contracts have quieted down still more. The wire trade so far this month has been a distinct disappointment to the mills. The Cambria Steel Company having started up its wire and wire nail mills is now an important factor in the trade. In spite of the falling off in business, it is stated that prices are being quite firmly held. We quote galvanized

barb wire at \$2.10; painted, \$1.80; annealed fence wire, \$1.60; galvanized, \$1.90; wire nails, \$1.80, and cut nails, \$1.65, f.o.b. Pittsburgh, full freight to destination added.

Spikes.—New business in April has been dull, and no large inquiries are in the market. Several railroads, notably the Panhandle, have sent in some fair specifications on contracts in the past week. The base price of railroad spikes is \$1.60, Pittsburgh, and \$1.65, Chicago, the two points being nearly on an even base.

Merchant Pipe.—The pipe trade is dragging a good deal, the new demand for merchant pipe being rather light. No large inquiries for oil or gas lines are in the market. It is stated that discounts on both iron and steel pipe printed on a previous page are being quite generally held.

Boiler Tubes.—Consumers are specifying only at a fairly satisfactory rate against contracts placed early in the year and most of which expire on June 30. The new list and classification on boiler tubes is printed on a previous page.

Coke.—An inquiry is in the market from a Cleveland blast furnace interest for 2000 tons of furnace coke per month over the last half of the year, but the business has not been closed. New inquiry for foundry coke is rather light. The Jamison Coal & Coke Company reports that it has sold in the last three weeks upward of 150,000 tons of standard grade 72-hour foundry coke for delivery over the last half at \$2.40 per net ton, at oven. The output of coke in the Upper and Lower Connellsville regions last week was about 349,000 net tons, a decrease over the previous week of 13,000 tons. It is probable that more ovens will be laid off, as the consumption of both furnace and foundry coke is lighter than for some time. We quote standard makes of 72-hour foundry coke at about \$2 for prompt shipment and \$2.25 to \$2.40 per net ton, at oven, for delivery over the remainder of the year. We quote standard makes of furnace coke for prompt shipment at \$1.60 to \$1.65, and for delivery over the next six months from \$1.80 to \$2 per net ton, at oven.

Iron and Steel Scrap.—The market is practically stagnant. There have not been any sales of moment in the past week, and there is absolutely no new inquiry. In many cases consumers are holding up shipments, or are rejecting material that under other conditions would be accepted. Embargoes on scrap are still in force at Monessen, Pa., and Follansbee, W. Va., and this has thrown much scrap on the market that is loaded on cars and has to be sold. Some small lots of heavy steel scrap ranging from carloads up to 100 tons and already loaded have sold as low as \$12.50, Pittsburgh, which is the lowest price for a very long time. The whole scrap trade is now in worse condition in every way than it has been at any time in some months. Dealers quote as follows, per gross ton, f.o.b. Pittsburgh, or elsewhere as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery.....	\$12.50 to \$12.75
No. 1 foundry cast.....	13.75 to 14.00
No. 2 foundry cast.....	12.75 to 13.00
Bundled sheet scrap, at point of shipment.....	9.00 to 9.25
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.....	14.50
No. 1 railroad malleable stock.....	12.50 to 12.75
Grate bars.....	10.50 to 10.75
Low phosphorus melting stock.....	16.75 to 17.00
Iron car axles.....	24.25 to 24.50
Steel car axles.....	18.50 to 18.75
Locomotive axles.....	23.00
No. 1 busheling scrap.....	12.50 to 12.75
No. 2 busheling scrap.....	9.00 to 9.25
Old car wheels.....	13.50 to 13.75
Sheet bar crop ends.....	15.50 to 15.75
*Cast iron borings.....	8.60 to 8.75
*Machine shop turnings.....	9.15 to 9.40
Old iron rails.....	16.00 to 16.25
No. 1 wrought scrap.....	14.25 to 14.50
Heavy steel axle turnings.....	10.25
Stove plate.....	10.50 to 10.75

* These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

Chicago

FISHER BUILDING, April 26, 1911.—(By Telegraph.)

General business conditions are not such as would call forth any great amount of enthusiasm. The pig iron market is still quiet, and sales of moderate size have begun to look big. The demand for structural material has somewhat subsided, and the bulk of Chicago business for the year has probably been let. Wire products easily maintain the lead in the lighter finished materials, with barb wire decidedly the most active item. Bars are not very active for the season, and there is constant rumor of price cutting. Old material continues to weaken, and as mills are well supplied little trading is being done. Several additional railroad ac-

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accumulations of scrap are being offered, but will probably be held for better prices, as have most recent accumulations of this nature. There is plenty of money in sight which bankers are anxious to see go into use, but the uncertainty instills timidity. Every natural condition definable is indicating a prosperous year in agricultural districts, yet industrial interests of all kinds dependent upon this condition continue to issue discouraging reports.

Pig Iron.—Although the market is far from active, a slight improvement in demand is noted. The reduction in the price of Lake ore made the past week has brought no change in prices of pig iron, and little business is being accepted on Northern brands for the last half at the present quotations. A Chicago foundry has purchased 780 tons of No. 2 Southern foundry. A sale reported to be of about 800 tons of Southern iron, which runs 5 to 6 per cent. silicon, has been made to a Milwaukee manufacturer of saw-mill machinery. A northern Illinois manufacturer of agricultural implements is reported to be in the market for about 800 tons of No. 2 foundry. Foundry stocks are decidedly lower than a month ago, and much of the last half business that has been held back these last few weeks can reasonably be expected to materialize soon. Most of the transactions that have been closed in the last week are the result of personal solicitation rather than mail bids. The following quotations are for Chicago delivery, with the exception of Northern irons, which are now quoted f.o.b. furnace, the minimum quotations being for April, May and June shipment, and the maximum for third quarter delivery:

Lake Superior charcoal.....	\$17.50 to \$18.00
Northern coke foundry, No. 1.....	15.50 to 16.00
Northern coke foundry, No. 2.....	15.00 to 15.50
Northern coke foundry, No. 3.....	14.75 to 15.25
Northern Scotch, No. 1.....	16.00 to 16.50
Southern coke, No. 1 foundry and No. 1 soft.....	15.85 to 16.35
Southern coke, No. 2 foundry and No. 2 soft.....	15.35 to 15.85
Southern coke, No. 3.....	15.10 to 15.60
Southern coke, No. 4.....	14.85 to 15.35
Southern gray forge.....	14.60 to 15.10
Southern mottled.....	14.60 to 15.10
Malleable Bessemer.....	15.00 to 15.50
Standard Bessemer.....	17.40 to 17.90
Basic.....	15.85 to 16.35
Jackson Co. and Kentucky silvery, 6%.....	17.90 to 18.40
Jackson Co. and Kentucky silvery, 8%.....	18.90 to 19.40
Jackson Co. and Kentucky silvery, 10%.....	19.90 to 20.40

(By Mail.)

Billets.—The Billet market has been somewhat quiet for the past few weeks, though small sales are continually being made. The leading interest maintains its price of \$30.60, base, Chicago, on open hearth forging billets, though this price is reported to be shaded by independent concerns. On rerolling billets the price continues \$25.60, base, Chicago.

Rails and Track Supplies.—Very little new business on either rails or track supplies has developed in the past seven days. Specifications are good and inquiries fair, but new business has been very light. Western railroads are still drawing in their nets of retrenchment, but the rail mills of this district have a fair amount of tonnage booked. Business that has been taken comes from a variety of sources and in small orders. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.15c. to 2.25c., base, all in carload lots, Chicago. Standard section Bessemer rails, 1.28c.; open hearth, 1.34c. Light rails, 40 to 45 lb., 1.16c. to 1.20 $\frac{1}{2}$ c.; 30 to 35 lb., 1.19 $\frac{1}{2}$ c. to 1.24c.; 16, 20 and 25 lb., 1.20 $\frac{1}{2}$ c. to 1.25c.; 12-lb., 1.25c. to 1.30 $\frac{1}{2}$ c., Chicago.

Structural Material.—The demand for structural material has been only fair for the past week. Mills are running at about 75 per cent. of their capacity and are making prompt delivery. Marshall & Fox, architects on the Federal Life Building, Chicago, are requesting bids on that building, which is designed for both standard and Bethlehem shapes. The Pan-American Bridge Company, Indianapolis, Ind., was the successful bidder on the buildings of the Haynes Automobile Company, Kokomo, Ind. This contract will consume 400 tons of steel. Railroad business continues to be extremely dull, and only imperative needs are receiving the attention of such purchasers. We quote plain material from mill 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—Plate mills are running at about 70 per cent. capacity, with no great volume of business in sight. As week after week comes up, however, sufficient business to keep the mills going comes to light. Rumors of price cutting are common, but the principal producers firmly maintain mill prices, which we quote 1.58c. to 1.63c.; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—A spirit of timidity is apparently dominating purchasers of sheets. Sales are small and evidently going into immediate consumption. Speculative buying and ant-

icipation of wants seem to have been entirely eliminated from the buyers' code. Mills are running at about 65 per cent. capacity, which is considered a fair amount of business at this time. The leading interests are maintaining prices, but it is reported that mills of smaller productive power are making concessions. Prices continue for Chicago as follows: Carload lots, from mill: No. 28 black sheets, 2.38c.; No. 28 galvanized, 3.38c.; No. 10 blue annealed, 1.83c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—As the season advances a better demand is noted for concrete reinforcing bars, which are not so much governed by price as by the ability to make prompt delivery. There is evidently a price weakening in iron bars, and constant rumors of prices as low as 1.22 $\frac{1}{2}$ c. are heard. It is believed by the principal producers that wherever these prices exist they must be made by mills whose rolls are limited to certain sizes. Regular prices are as follows: Soft steel bars, 1.58c.; bar iron, 1.25c. to 1.30c.; hard steel bar rolled from old rails, 1.30c. to 1.35c., all Chicago; from store, soft steel bars, 1.80c. to 1.90c., Chicago.

Wire Products.—The demand for all kinds of wire products continues very active. Nail and fence wire orders are now being taken care of with comparative ease, and shipments are being made promptly. Orders for barb wire are crowding mills to their utmost capacity, producers being about two weeks behind with their orders. The South and Southwest continue to send in a fine volume of business, and the Northwest, where trade has been a little dull, is improving. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire No. 9 and coarser, base, 1.78c.; wire nails, 1.98c.; painted barb wire, 1.98c.; galvanized, 2.28c.; polished staples, 1.98c.; galvanized, 2.28c., all Chicago.

Cast Iron Pipe.—Actual business lately closed has been comparatively small, yet specifications are liberal and inquiries frequent. Kansas City, Kan., has purchased 400 tons of water pipe for additions to its system. Helena, Mont., has been in the market for 4000 tons of water pipe, but this week all bids were rejected, awaiting the probable purchase by that city of the old water works system now in use. This matter will be brought before the consideration of the Helena voters in the near future, and at no distant date this inquiry will probably again become active. Considerable purchases have been made by the smaller gas producing companies, but none of these was of large tonnage. Prices remain firm, per net ton, Chicago: Water pipe, 4-in., \$25.50; 6 to 12 in., \$24.50; 16-in. and up, \$24, with \$1 extra for gas pipe.

Old Material.—The scrap market has been a little more active than for the past few weeks, although most of it has been done on a scale that continues down. New railroad lists have appeared in this district from the Nickel Plate, the Chicago, Milwaukee & St. Paul and the Rock Island. The list of the first mentioned road approximates 600 tons and closes April 26. The Chicago, Milwaukee & St. Paul list totals 3000 tons and closed Tuesday. The principal item on this list is 500 tons of No. 1 cast. The Rock Island list approximates 3200 tons and the principal item is 600 tons of No. 1 steel rails. This list closes April 27. Comparatively little railroad scrap is being sold, and stocks that tax the storage yards are being accumulated. Scrap prices are without strength and mills are well supplied. Prices are for delivery to buyers' works, all freight and transfer charges paid, and are as follows, per gross ton:

Old iron rails.....	\$14.25 to \$14.75
Old steel rails, rerolling.....	13.00 to 13.50
Old steel rails, less than 8 ft.....	12.25 to 12.75
Relaying rails, standard sections, subject to inspection.....	22.00 to 23.00
Old car wheels.....	13.25 to 13.75
Heavy melting steel scrap.....	11.50 to 12.00
Frogs, switches and guards, cut apart.....	11.25 to 11.75
Shoveling steel.....	10.75 to 11.25

The following quotations are per net ton:

Iron angles and splice bars.....	\$12.50 to \$13.00
Iron arch bars and transoms.....	14.00 to 14.50
Steel angle bars.....	11.00 to 11.50
Iron car axles.....	18.75 to 19.25
Steel car axles.....	17.75 to 18.25
No. 1 railroad wrought.....	11.25 to 11.75
No. 2 railroad wrought.....	10.25 to 10.75
Steel knuckles and couplers.....	10.25 to 10.75
Locomotive tires, smooth.....	17.00 to 17.50
Steel axle turnings.....	7.50 to 8.00
Machine shop turnings.....	6.50 to 7.00
Cast and mixed borings.....	5.25 to 5.75
No. 1 bushelling.....	9.25 to 9.75
No. 2 bushelling.....	7.00 to 7.50
No. 1 boilers, cut to sheets and rings.....	8.00 to 8.50
Boiler punchings.....	12.00 to 12.50
No. 1 cast scrap.....	11.25 to 11.75
Stove plate and light cast scrap.....	9.50 to 10.00
Railroad malleable.....	11.00 to 11.50
Agricultural malleable.....	9.75 to 10.25
Pipes and flues.....	8.25 to 8.75

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Philadelphia

PHILADELPHIA, PA., April 25, 1911.

The demand in general continues along narrow lines, structural shapes being the only exception. Pig iron is very dull, consumers showing little interest in the market. About an even demand is reported for steel plates. The demand for billets and sheets drags. Refined iron bars are lower, with little business moving. Old material shows but little movement, and prices continue weak.

Iron Ore.—The announcement that independent Lake ore producers had reduced the price 50c. a ton for this year's ore supply has been received with considerable interest. A reduction is also announced ranging from 25c. to 35c. a ton on Fort Henry ores for this season's delivery. These reductions are not expected to affect the foreign ore situation in this district, although transactions in Swedish ore have been held up pending the settlement of the Lake ore question. The inability to secure charters at favorable rates restricts the movement in Spanish ores. Importations at this port for the week ending April 22 included 11,430 tons of Cuban and 9660 tons of Swedish ore, at a total value of \$87,161. The steamship Tellus arrived to-day with 12,400 tons of ore, the first of the season's movement in Wabana ore to this port. It was the largest cargo of ore ever received here.

Pig Iron.—The probable effect of lower lake ore prices is the leading topic of interest, but it is pretty generally believed that no reductions in pig iron prices will result, as the action of ore producers had been largely discounted. With the lower cost of ore, however, consumers see no immediate prospect of higher prices for second quarter iron, and, therefore, show little interest in the market. Producers are not disposed to force sales, as it is apparent that consumption is about equal to the current make, and from reports of stocks in buyers' yards it is evident that the iron taken is being pretty freely consumed. It is not unlikely that some further curtailment of the merchant furnace production will be made in the near future, as some makers contend that they will do this rather than reduce the present level of prices. In a few cases, however, orders for third quarter are being taken at the prices now prevailing for second quarter. The principal transactions during the week have been in low grade iron, one of the Delaware River cast iron pipe makers closing for several thousand tons, understood to include both Northern and Southern iron, for June and July shipment. In one instance \$10.50, Birmingham, was done for No. 3 Southern foundry. Pipe makers are still showing some interest in the market. In the higher grades of foundry iron the movement has been light. Sales of No. 2 X and No. 2 plain foundry iron have been confined to small lots, few exceeding 200 tons, for comparatively early delivery. Prices show no change, eastern Pennsylvania No. 2 X ranging from \$15.50 to \$16, delivered in this vicinity. Few sales are reported by sellers of Virginia foundry irons, and the ruling price of \$13, furnace, for standard No. 2 X iron is maintained, although report has it that a small lot of special analysis iron was sold slightly under that basis. Some of the Virginia producers are seriously considering selling into the third quarter at present prices, but so far deliveries have been confined to the second quarter. Forge iron has been in less active demand, but prices appear to be firm at recent quotations. Little interest is shown by consumers of the steel making grades. Sales of low phosphorus iron have been light, with prices unchanged. One consumer in the central part of the State has been negotiating for a small lot of basic iron, and is understood to have bought 1000 tons at \$15, delivered. While quotations for this grade are largely nominal, some sellers state that they would be willing to do business if it were offered at that figure. The following range of prices represents the market for standard brands, delivered in buyers' yards, eastern Pennsylvania and nearby points during the second quarter:

Eastern Pennsylvania, No. 2 X foundry	\$15.50 to \$16.00
Eastern Pennsylvania, No. 2 plain	15.25 to 15.50
Virginia, No. 2 X foundry	15.80 to 16.00
Virginia, No. 2 plain	15.80 to 16.00
Gray forge	14.75 to 15.00
Basic	15.00
Standard low phosphorus	21.50 to 22.00

Ferromanganese.—No fresh demand has come out in this territory, although sellers are figuring on several moderate inquiries from the West. Quotations still show considerable variation, but \$36.50 to \$37, Baltimore, about represents the range at which business has been done.

Billets.—Buyers are still satisfied to place orders for small lots for immediate consumption and show no interest in business of a forward character. Current orders are just about sufficient to keep Eastern mills operating at their recent productive rate. Prices are maintained at \$25.40 for open hearth rolling billets and \$30.40 for ordinary forging billets, delivered in this vicinity.

Plates.—There has been a fair run of small orders, which

just about enables mills to maintain their recent rate of production. Considerable business is in sight, particularly for bridge, structural, tank and boiler work, and the trade considers the outlook a shade more favorable. With few exceptions, mills are not well supplied with forward orders and are compelled to depend on the day to day demand to maintain their present operating rate. Prices are well held, 1.55c. minimum, being quoted for ordinary plates, delivered in buyers' yards in this district.

Structural Material.—The demand for fabricated work for buildings and bridges continues quite active, due to a large extent, no doubt, to the extremely low prices prevailing. Efforts to bring about an end to the sharp cutting which has prevailed for some little time continue, but as far as can be learned not much progress has been made. The contract for the structural work for the new mill of the Reading Iron Company, 900 tons, has been let, as has also that for highway bridges and a bridge over the Schuylkill River at Norristown, for the Philadelphia & Western Railroad, for which about 3000 tons will be required. Bridge work in connection with the elevation of the Philadelphia & Reading Railway, in the Kensington district, is up, as are also structural requirements ranging from 200 to 300 tons for small buildings. A fair demand for plain shapes is reported, for which prices are firmly maintained at 1.55c. minimum, delivered in this territory.

Sheets.—Current business is in small lots and principally for prompt delivery. Consumers are not disposed to place orders for extended shipment, and mills in this district have but little tonnage ahead on their books. The current demand is sufficient in the aggregate to keep plants pretty fully engaged. Eastern mill quotations for prompt shipments are unchanged as follows: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—There has been a decided slackening in the demand for refined iron bars, and lower quotations are named in competition for desirable specifications. Mill quotations range from 1.25c. to 1.30c., depending on the character of the business, which is equal to 1.32½c. to 1.37½c., delivered in this vicinity, and hardly considered strong at that level. A slight increase in specifications against steel bar contracts comes from agricultural interests, but the quantity is still below normal. Steel bars are firm at 1.55c., delivered in this neighborhood.

Coke.—The movement has been extremely light. Consumers are supplying their needs with purchases of prompt coke, which can be had at unchanged prices. Little forward business is being transacted. Furnace coke for prompt shipment can be had at \$1.55 to \$1.65, at oven, while for forward delivery \$1.75 to \$2, at oven, is asked. Foundry coke for prompt shipment is quoted at \$2, at oven, with \$2.20 to \$2.40 for extended shipment. The following range of prices, per net ton, is named for delivery in buyers' yards in this vicinity:

Connellsville furnace coke	\$3.70 to \$4.05
Foundry coke	4.15 to 4.55
Mountain furnace coke	3.30 to 3.65
Foundry coke	3.75 to 4.15

Old Material.—Consumers show little interest in the market, and even bargain lots are losing their attraction. In some cases buyers are canceling uncompleted shipments against monthly deliveries, particularly when purchases were made at prices above the present level. Heavy melting steel is lower, with odd lots offered to consumers at \$13, delivered; in a number of instances, however, consumers will pay \$13.25 and even \$13.50 if the material is strictly high grade. There has been little movement in the rolling mill grades of old material. No. 1 wrought is in light demand, while wrought iron pipe is 25c. under last week's quotations. Special grades are inactive, although sales of old iron rails and old car wheels have been made at prices under recent quotations. In the majority of grades quotations are nominal, insufficient business being transacted to establish a market. The following range of prices about represents the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 35c. to \$1.35 per gross ton:

No. 1 heavy melting steel scrap	\$13.00 to \$13.50
Old steel rails, rerolling	14.50 to 15.00
Low phosphorus heavy melting steel	
scrap	17.75 to 18.25
Old steel axles	20.00 to 20.50
Old iron axles	25.00 to 26.00*
Old iron rails	17.00 to 17.50
Old car wheels	13.00 to 13.50
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire	11.75 to 12.25
No. 2 light iron	7.50 to 8.00*
Wrought turnings	8.50 to 9.00
Cast borings	8.00 to 8.50
Machinery cast	13.25 to 13.75
Railroad malleable	12.00 to 12.50
Grate bars	11.50 to 12.00
Stove plate	10.50 to 11.00

* Nominal.

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Cincinnati

CINCINNATI, OHIO, April 26, 1911.—(By Telegraph.)

Pig Iron.—Transactions are very light and the small spot shipment business that was reasonably good 30 days ago continues to fall off materially. Both producer and consumer seem to have adopted a waiting policy, and the marked lack of inquiry does not augur well for any immediate change. Probably the largest inquiry being worked on here is for 500 tons for a local manufacturer for last half shipment. Southern iron will probably be purchased. A local agency sold 1000 tons of No. 3 Southern foundry for June-July shipment at \$10.50, Birmingham. Several producers are quoting for last half shipment above present prompt delivery prices of \$11, Birmingham, and \$14, Iron- ton, for No. 2 foundry, but a number of standard brands are available at these figures for movement through the last half. Northern basic is quiet and is quotable around \$14 to \$14.25, Iron-ton, for prompt shipment, with the probabilities that at the last named figure delivery could be extended throughout the year. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Iron-ton, we quote f.o.b. Cincinnati, as follows, for first quarter:

Southern coke, No. 1 foundry.....	\$14.75
Southern coke, No. 2 foundry.....	14.25
Southern coke, No. 3 foundry.....	13.75
Southern coke, No. 4 foundry.....	13.50
Southern coke, No. 1 soft.....	14.75
Southern coke, No. 2 soft.....	14.25
Southern gray forge.....	13.00
Ohio silvery, 8 per cent. silicon.....	17.70
Lake Superior coke, No. 1.....	15.70
Lake Superior coke, No. 2.....	15.20
Lake Superior coke, No. 3.....	14.70
Basic, Northern.....	\$15.20 to 15.45
Standard Southern car wheel.....	25.25
Lake Superior car wheel.....	19.50

(By Mail.)

Coke.—A few scattered contracts for foundry coke have been closed, but the tonnage involved is very small. Inquiries for both foundry and furnace coke are scarce, although one for 48-hour coke is being figured on, aggregating about 600 tons per month. Prices are not quite so firm, but on standard brands there has been no appreciable change, and for spot shipment foundry coke is quoted in all three districts around \$2 per net ton, at oven, and from \$2.10 to \$2.25, and, in some cases, as high as \$2.40 per net ton on contracts. Furnace coke remains at \$1.50 to \$1.55 for immediate shipment and from \$1.65 to \$1.75 per net ton, at oven, for future delivery.

Finished Material.—Structural material, in small quantities, continues to move freely, but no large contracts have been reported lately. However, there are a number of buildings contemplated in this section that will call for a large tonnage; work on several of these is expected to commence before the fall season begins. Mill agencies are understood to be adhering strictly to the 1.40c., Pittsburgh, quotation, and warehouse prices are from 1.90c. to 1.95c.

Old Material.—The past week was extremely dull. In a few instances there has been a shading of present quotations, but inquiry reveals the fact that the scrap was already loaded on cars, and to save rehandling some sacrifices in prices were made. Buying on the part of the dealers is very light. Prices for delivery in dealers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton.....	\$11.50 to \$12.00
Cast borings, net ton.....	4.50 to 5.00
Steel turnings, net ton.....	5.1. to 6.25
No. 1 cast scrap, net ton.....	10.00 to 10.50
Burnt scrap, net ton.....	7.50 to 8.00
Old iron axles, net ton.....	16.50 to 17.00
Bundled sheet scrap, gross ton.....	7.50 to 8.50
Old iron rails, gross ton.....	14.00 to 15.00
Relaying rails, 50 lb. and up, gross ton.....	21.00 to 22.00
Old car wheels, gross ton.....	11.50 to 12.50
Heavy melting steel scrap, gross ton.....	10.00 to 10.50

Birmingham

BIRMINGHAM, ALA., April 24, 1911.

Pig Iron.—Perhaps there have been periods in the iron history of Alabama when the market was more quiet, but a canvass of the situation here now would lead one to believe that such was not the case. The general report is that there have been no sales of consequence. While there is no doubt that, as a general proposition, business in iron and steel lines has developed unusual dullness, yet it is felt here that the present condition of tariff legislation is responsible for the immediate lack of orders. Then, buyers are waiting to see what result a 50c. cut in Lake ore will have on the pig iron market. It is believed here, however, that this reduction in ore prices had been thoroughly discounted. Still the announcement itself has a tendency to further delay buying. The \$11 schedule seems meanwhile to have been well established for prompt and for forward de-

livery running through the year 1911. Well posted ironmen here insist that the basis of \$11 for No. 2 means no margin of profit to the manufacturer, despite the statement reported to have been made in Congress the past week to the effect that pig iron costs only \$7.50 to produce in this district. It is more generally thought here that a proper range of cost at the different furnaces, with necessary allowances made for depreciation, overhead charges, royalties, &c., would show from \$9.50 to \$11.50. With \$11 for No. 2, it would mean an average of less than \$10.50 at the furnace for the total output, and from this figure must come the cost of selling; but, as one party suggested, "much depends upon how costs are figured month by month." The following schedule of prices represents the current pig iron market, these prices being per gross ton on board cars at furnaces in this immediate district:

No. 1 foundry and 1 soft.....	\$11.50
No. 2 foundry and 2 soft.....	11.00
No. 3 foundry.....	10.50
No. 4 foundry.....	\$10.00 to 10.25
Gray forge.....	9.50 to 9.75
Standard basic, chill cast.....	11.00
"Off" basic.....	10.50
Charcoal car wheel iron.....	22.50

Cast Iron Pipe.—The past week proved barren of results as to any large lettings. The same "wait-a-while" feeling that is experienced with buyers of pig iron is met with in dealing with consumers of cast iron pipe. Prices are firmer and being well maintained, due to the fact that the foundries are still fairly busy shipping on old contracts and feel that present asking prices could be obtained on what business is going as well as a cut price of, say, \$1 per ton. Quotations, therefore, remain as follows, per net ton, f.o.b. cars here: 4 to 6 in., \$23; 8 to 12 in., \$22 over \$12-in., average \$21, with the customary differential of \$1 more for gas pipe.

Old Material.—Some dealers report a still better feeling in the scrap market, but the state of trade is such that any sale of consequence has the tendency to make the parties interested feel that conditions are on the up grade. From this it may be judged that the scrap situation in this district is not as yet a very happy one. Dealers' asking prices are as follows, per gross ton, 2240 lb., on board cars here:

Old iron axles (light).....	\$14.50 to \$15.00
Old steel axles (light).....	13.50 to 14.00
Old iron rails.....	13.00 to 13.50
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	10.50 to 11.00
No. 1 country wrought.....	8.00 to 8.50
No. 2 country wrought.....	7.50 to 8.00
No. 1 machinery.....	10.50 to 11.00
No. 1 steel.....	9.50 to 10.00
Tram car wheels.....	9.00 to 9.50
Standard car wheels.....	10.50 to 11.00
Light cast and stove plate.....	8.00 to 8.50

St. Louis

ST. LOUIS, April 24, 1911.

The market for pig iron is very dull, as far as new business is concerned, but specifications on contracts are coming in satisfactorily. There is some movement in coke, two large sales having been made last week. It is reported that \$1,000,000 is being expended this spring in this city in the construction of apartment houses alone, and dealers in building material and house furnishings are busy. Leading jobbers in heavy hardware and iron are having a good country trade.

Pig Iron.—Large consumers of pig iron in this district seem to have withdrawn from the market temporarily, as none of the leading brokers was able to report either inquiries or sales for the past week which represented any tonnage of importance. The same conditions prevailed with the merchant sellers, though one house stated that it had made several small sales for prompt shipment. Buyers seem to be waiting to note the course of the market, and also to gauge the demand for the finished product, and in the meantime a hand-to-mouth policy will prevail among consumers who are in the habit of buying round lots. The only inquiries reported were for 300 tons of No. 2 Southern foundry, for shipment over the last half, and 150 tons of No. 1 soft for prompt delivery. While there is no change in price to report, the tone of the market is weaker. We quote No. 2 Southern foundry at \$11, Birmingham, for any shipment prior to January, 1912, except for fourth quarter only, which is held at \$11.50. No. 2 Northern is offered at \$14, Iron-ton, Ohio, for any delivery except last quarter, which is held at \$14.50.

Coke.—Large buyers are in the market for coke to some extent. The inquiry from a local steel foundry for 1500 tons of foundry and furnace is still pending, and this also is the case with the inquiry for 5000 tons of foundry. Among the sales reported are 3000 tons of Stonega foundry, for shipment over the year, and 4000 tons of by-product coke, for shipment over the second quarter. The market

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is steady, with prices ranging from \$2.15 to \$2.40 per net ton for selected Connellsville 72-hour foundry, at oven; carloads 25c. per ton higher.

Finished Iron and Steel.—The demand for finished products has eased up somewhat each week since the month came in. The leading interest reports the sale of 500 tons of standard rails to an Oklahoma interurban railroad. For light rails the demand is limited. Structural material is in fair request. Bars are in moderate demand. The call for track fastenings, while steady, is not large.

Old Material.—Business in scrap iron and steel is wholly confined to dealers, there being no demand from consumers. Stocks, however, are pretty well cleaned up. The railroad offerings the past week were small—700 tons by the St. Louis & San Francisco and 100 tons by the Clover Leaf Line. Relaying rails are in fair demand and steady, but the market is softer and prices for several items in the list are lower. We quote dealers' prices, per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$13.00 to \$13.50
Old steel rails, rerolling.....	11.75 to 12.25
Old steel rails, less than 3 ft.....	10.75 to 11.25
Relaying rails, standard sections, subject to inspection.....	23.00 to 23.50
Old car wheels.....	12.50 to 13.00
Heavy melting steel scrap.....	10.75 to 11.25
Frogs, switches and guards, cut apart.....	10.75 to 11.25

The following quotations are per net ton:

Iron fish plates.....	\$10.75 to \$11.25
Iron car axles.....	17.00 to 17.50
Steel car axles.....	16.75 to 17.25
No. 1 railroad wrought.....	10.75 to 11.25
No. 2 railroad wrought.....	9.75 to 10.25
Railway springs.....	9.50 to 10.00
Locomotive tires, smooth.....	16.00 to 16.50
No. 1 dealers' forge.....	9.00 to 9.50
Mixed borings.....	4.50 to 5.00
No. 1 bushing.....	9.00 to 9.50
No. 1 boilers, cut to sheets and rings.....	7.75 to 8.25
No. 1 cast scrap.....	10.00 to 10.50
Stove plate and light cast scrap.....	8.50 to 9.00
Railroad malleable.....	8.50 to 9.00
Agricultural malleable.....	7.50 to 8.00
Pipes and flues.....	8.00 to 8.50
Railroad sheet and tank scrap.....	7.50 to 8.00
Railroad grate bars.....	8.00 to 8.50
Machine shop turnings.....	6.50 to 7.00

The Missouri Valley Bridge & Iron Company has been awarded the contract for a three-span bridge in California, requiring 130 tons of steel.

Smoke Inspector E. C. Parker, in his report to Mayor Kreismann, states that \$505,000 was spent in St. Louis in the past year for the installation of smoke-consuming devices, and \$317,000 was expended in the reconstruction of factories in order to do away with the smoke nuisance. He estimates that not less than \$1,000,000 will be expended in this direction the coming year. Thus far 824 plants have been altered.

William Love, Lafayette, Ind., has been awarded the contract to build and equip the Oklahoma & Golden City Railroad, to run from Jefferson City, Mo., to Fairview, Okla., a distance of 388 miles.

An 18-story office building will be erected at Dallas, Texas, for the Southwestern Life Insurance Company, by the American Construction Company, Houston.

Cleveland

CLEVELAND, OHIO, April 25, 1911.

Iron Ore.—As forecasted last week, prices on Lake Superior ores have been established for 1911 at a reduction of 50c. a ton from last season's prices on both Bessemer and non-Bessemer grades. A number of sales fixing the prices on the new basis were made by both Cleveland and Pittsburgh interests late in the week. The ore actually contracted for in the past few days, and for which negotiations are now pending, aggregates a good round tonnage, but the bulk of it goes to affiliated blast furnace and steel interests. Otherwise, not much activity has been aroused in the market, little tonnage being sold to independent merchant furnaces. Quite a large tonnage of ore reservations that were made earlier in the season, mostly for Bessemer grades, are now being converted into contracts. After the requirements of a few of the large consumers having ore connections are provided for, the market is expected to settle down without any active general buying movement. A large share of the merchant furnace interests have enough ore on hand to last them until late in the year, and many of these are not able to estimate their requirements and will probably not come into the market until late in the year. Many will require only a small tonnage as compared with their usual purchases. Ore carrying charges have not yet been fixed by vesselmen, but will probably be decided upon this week. The Pittsburgh Steamship Company has started 10 of its boats. Not many boats have as yet been placed in commission by other owners. So far only two cargoes of ore have reached lower

lake ports. We quote prices as follows: Old range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; old range non-Bessemer, \$3.70; Mesaba non-Bessemer, \$3.50.

Pig Iron.—The establishment of ore prices has as yet aroused no activity in the pig iron market. Some buyers, however, are known to have been holding off until the ore price question was disposed of, and it is expected that these will begin feeling around shortly for prices. Prices remain nominally unchanged, and whether present quotations will be reduced cannot be determined until sufficient inquiry comes out to test the market. As the reduction in the price of ore had been discounted for some time by furnacemen, many of whom claim they have been selling their product at or below cost, it is believed that present prices will be pretty well maintained. Another factor that will enter the situation is the fact that very little iron made from the lower priced ore will be offered on the market for some time. The largest inquiry pending is from an Akron, Ohio, furnace manufacturer for 500 tons of No. 2 Southern iron for the last half delivery. For the last half delivery Northern foundry iron is held at \$14.25 to \$14.50 for No. 2. For prompt shipment and the second quarter we quote, delivered, Cleveland, as follows:

Bessemer.....	\$15.90
Basic.....	14.50
Northern foundry, No. 1.....	14.50
Northern foundry, No. 2.....	14.25
Gray forge.....	13.50
Southern foundry, No. 2.....	15.35
Jackson Co. silvery, 8 per cent. silicon.....	18.00

Coke.—The only sales reported are foundry grades in small lots for spot shipment. We quote standard Connellsville furnace coke at \$1.60 to \$1.65 per net ton, at oven, for spot shipment, and \$1.75 to \$2 for the last half. Connellsville 72-hour foundry coke is held at \$2 for spot shipment and \$2.25 to \$2.50 for the last half.

Finished Iron and Steel.—The demand in finished lines is not active. Mills are getting a fair volume of orders, but they are nearly all for small lots. Jobbers report a fair volume of warehouse orders. Mill agencies report more competition than usual from mills that reroll hard steel bars. The latter are quoting low prices and are taking some orders from the implement trade and other consumers that usually take soft steel bars. A price as low as 1.20c., Pittsburgh, has been quoted on hard steel bars for prompt shipment, and low prices for contracts for a year. In spite of the activity of the rerolling mills, prices on soft steel bars remain firm at 1.40c., Pittsburgh. The Cleveland, Alliance & Mahoning Valley Railroad has placed a contract with the Cambria Steel Company for 2000 tons of rails for a new traction line. In structural material and plates not much new business is coming out, but good specifications for plates are being received from the shipbuilding companies. The Bellefontaine Bridge Company has taken the contract for 400 tons of steel for a beet sugar plant to be built by the Dyer Company of Cleveland at Findlay, Ohio. John Eichley, Pittsburgh, has secured the contract for 300 tons of steel for a hotel in Youngstown, Ohio. Some of the local structural work that has been pending for some time will be let shortly. Bids will be asked for in a few days for the Central Y. M. C. A. building, requiring 2000 tons, and the Statler hotel, requiring 1200 tons. The demand for sheets is only fair. While some price concessions are being made, a number of the independent producers are holding firmly to the established prices. The demand for iron bars continues light. One local mill is running full and the other at half capacity. Bar iron prices are stationary at 1.30c. to 1.35c., at mill.

Old Material.—The market is very quiet and prices on several grades have declined. Heavy melting steel is 50c. a ton lower in the local market. Cleveland consumers are offering a maximum price of \$12 a ton. For outside shipment, dealers report that the best price they can obtain is \$13, delivered. Local mills are well supplied with scrap and are holding back on shipments. The Nickel Plate Railroad will close April 26 on about its usual list. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails.....	\$13.50 to \$14.00
Old iron rails.....	15.00 to 15.50
Steel car axles.....	18.50 to 19.00
Heavy melting steel.....	11.50 to 12.00
Old car wheels.....	12.50 to 13.00
Relaying rails, 50 lb. and over.....	22.50 to 23.50
Agricultural malleable.....	11.50 to 12.00
Railroad malleable.....	12.50 to 12.75
Light bundled sheet scrap.....	8.00 to 8.50

The following prices are for net ton, f.o.b. Cleveland:

Iron car axles.....	\$21.00 to \$21.50
Cast borings.....	6.25 to 6.50
Iron and steel turnings and drillings.....	6.75 to 7.00
Steel axle turnings.....	9.00 to 9.25
No. 1 bushing.....	10.50 to 11.00
No. 1 railroad wrought.....	12.25 to 12.50
No. 1 cast.....	11.25 to 11.50
Stove plate.....	10.25 to 10.50
Bundled tin scrap.....	11.00 to 11.50

THE IRON AND METAL MARKETS

Buffalo

BUFFALO, N. Y., April 25, 1911.

Pig Iron.—Sales by furnaces in this district aggregate about 15,000 tons since last week's report, principally foundry grades, with inquiries pending for 12,000 to 15,000 tons of foundry and forge irons. The tendency of the market since the first of the present week, however, has been toward inactivity, as buyers as a rule are now waiting to see what effect the reduction in the price of ore will have. In consequence there has been comparatively little buying the present week to date. Furnaces are apparently apathetic regarding new business, even at previously prevailing prices, for the reason that the reduction in the price of ore was fully discounted by them some weeks ago, and, in fact, over-discounted in some instances. Some furnaces are inclined to restrict production in preference to continuing to sell below cost. Furnace C of the Buffalo Union Furnace Company was blown out on Tuesday. Shipments on contracts are going forward from furnaces in fairly good volume. Price schedules remain practically unchanged since last week, although it is learned that in some particular instances slightly lower offers have been accepted. We quote as follows, f.o.b. Buffalo, for second quarter delivery:

No. 1 X foundry.....	\$14.25 to \$14.75
No. 2 X foundry.....	14.00 to 14.50
No. 2 plain.....	13.75 to 14.00
No. 3 foundry.....	13.50 to 13.75
Gray forge.....	13.25 to 13.50
Malleable.....	14.00 to 14.50
Basic.....	14.25 to 14.75
Charcoal.....	16.75 to 17.50

Finished Iron and Steel.—Steel bars and plates are rather quiet and current orders running in smaller tonnages as a rule than for two or three weeks. A little inquiry is being received from agricultural implement makers, who are beginning to manifest some interest in the market for their season's requirements in bars. One selling interest reports the closing of two bar contracts of moderate tonnage. The Canadian export trade is holding a good pace, the same as for the past several months, showing a good total for the week both for current orders and specifications on contracts. Increased activity is noted in shapes and in fabricated structural material. Bids are being received this week for the 350 tons of fabricated steel for the Eastman Kodak Company's new building, Rochester; also for 400 tons for the Hickey-Freeman Company's building, Rochester, and for steel for a seven-story department store for I. Rosenbloom, Syracuse, and a six-story building of similar character for Rosenbloom & Sons of the same city, both requiring considerable tonnages. Bids will also soon be received for steel for the German Deaconess' Hospital building, Buffalo, about 200 tons. Contract for the Huebner-Bleistein Patents Company's lithographing plant, Buffalo, 200 tons, was awarded to the Buffalo Structural Steel Company.

Old Material.—The market remains exceedingly quiet. Buyers are taking no interest at present, their requirements being covered apparently for business in hand. There is no quotable change in prices, although the tendency is weak. There has, however, been insufficient business to test the market. We quote as follows, per gross ton, f.o.b. Buffalo, the prices shown being almost entirely nominal:

Heavy melting steel.....	\$12.00 to \$12.50
Low phosphorus steel.....	16.00 to 16.50
No. 1 railroad wrought.....	14.00 to 14.25
No. 1 railroad and machinery cast scrap..	13.50 to 14.00
Old steel axles.....	19.00 to 19.50
Old iron axles.....	22.50 to 23.50
Old car wheels.....	13.75 to 14.25
Railroad malleable.....	13.50 to 13.75
Boiler plate.....	10.50 to 10.75
Locomotive grate bars.....	10.75 to 11.25
Pipe.....	9.00 to 9.25
Wrought iron and soft steel turnings..	6.50 to 7.00
Clean cast borings.....	6.00 to 6.25

The German Iron Market

BERLIN, April 13, 1911.

The news from the industrial districts indicates that a very quiet tone prevails, but that work is proceeding at the furnaces and mills at a normal pace. The March pig iron production was announced several days ago as having again established a new record. The total was 1,322,144 metric tons, or about 1400 tons more than in January, the month of greatest previous production; and it exceeded the production of March, 1910, by 72,000 tons. The Steel Works Union has also given out shipment figures for March beating all previous records. The movement in rails and other track material, structural shapes and semimanufactured steel reached a total of 633,000 tons, or about 219,000 tons more than in February. The March shipments included 235,000 tons of steel rails and ties. The shipments were heavily increased by reason of the fact that the month ended the

Union's fiscal year, and the companies were rushing shipments in order to finish up the year's business.

The calls for delivery of native ores are of regular and normal volume. The price for brown iron ore from the Nassau district for the second half year has been recently marked up to 15.50 marks, on a basis of 50 per cent. iron. Furnacemen complain that this price is too high, considering the price of iron; and this, they say, is also true of foreign ore prices. The latter are still firmly held, and this is also the case with manganese ores. Imports of iron ore in March reached extraordinary proportions, having amounted to 1,074,000 tons, as compared with 530,000 tons in March, 1910. Exports amounted to 227,000 tons, or about 11,000 less than a year ago.

The pig iron trade is quiet, but foreign orders continue to come in. The great establishments of Westphalia and the lower Rhine are said to have orders sufficient to keep their furnaces running till the end of the year, along with the usual supplementary orders that are regularly to be expected; but the Siegen furnaces can still take on orders for the latter half of the year. The furnaces of that region have called a meeting to consider new overtures of the Essen Syndicate looking toward their joining the combination. Another effort is also to be made to persuade the Luxemburg-Lorraine furnaces to join.

After the export trade in steel material had been active for some weeks it has now grown more quiet. The home demand continues unchanged, and prices are fixed. Business in bars has been somewhat better of late, but the change is not marked. Foreign demand continues, but prices for export have been lifted somewhat since the convention broke up, involving the discontinuance of the export drawbacks. It is asserted that bars for export cannot be had now under 97.50 marks, and some selling is done as high as 100 marks. The bar iron mills are doing well, and orders are coming in freely. Orders for hoops and bands are also rather heavy, and the mills have work ahead for a considerable time. The manufacturers of cold rolled strips are well supplied with orders, but new business is not coming in so fast as previously. Mills running on steel tubing are working to their full capacity; orders are heavy, but prices are poor, and there is no prospect of reconstructing the trade combination that broke up last year. Export business in steel beams is pretty good at 106 marks, on board ship. Export orders for heavy plates are brisk, and home business also seems rather better; the latter is also true of export business in the thinner qualities of sheets. The tin plate mills are enjoying an unusually prosperous trade.

The home railroad authorities have placed some supplementary orders for rails and ties for summer delivery, and foreign orders for heavy rails continue to arrive in good quantities. The heavier qualities of grooved rails are also in better demand, for both home and foreign consumption.

The annual report of the Steel Works Union shows that two-thirds of its increase in shipments for the past year was made in rails, which would mean a gain of about 200,000 tons in that specialty. The total shipments of the Union in class A products reached 5,314,900 tons, as against 5,017,200 tons for the previous year.

Business in steel castings continues to gain in volume, but prices are too low to meet the views of manufacturers. The seven largest German manufacturers of cast iron pipes have effected a trade combination, with headquarters at Cologne.

The spring trade in most branches of the hardware trade has grown quite brisk. It is reported, however, that the export trade has grown more difficult, especially in the United States and Austria. Larger orders have been sent in for builders' hardware in expectation of greater activity in building operations. Makers of tools report that their trade is quieter, and this seems also to be the case with the cutlery trade at Solingen.

The news from the Belgian market this week is less favorable. The export price for bar iron has been reduced 1 shilling, and for basic steel bars 1 to 2 shillings.

New York

NEW YORK, April 26, 1911.

Iron Ore.—Considerable sales of Port Henry ores have been made recently for 1911 delivery at prices about 25 cents below those of 1910 for furnace and lump ores and 35 cents a ton less than in 1910 for concentrates. Prices for 1911 are per ton rather than on the unit basis which in 1910 was 6¼ cents. Sales made by Witherbee, Sherman & Co., Inc., and the Port Henry Iron Ore Company have been on the following basis, f.o.b. mines at Mineville, N. Y., for this year's delivery: Old Bed No. 21 furnace ore, \$2.90; Old Bed No. 21 lump ore, \$3.40; Old Bed concentrates, carrying 65 per cent. iron, \$3.70; Hammer ore, carrying 62 per cent. iron, \$3.50.

Mechanical and Civil Engineers,

PITTSBURGH, PA.

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Cast Iron Pipe.—Conditions are exceedingly quiet in this branch of trade. A few public lettings are coming up, but in no case is the quantity of much significance. Quotations on carload lots of 6-in. are continued at \$21 to \$22 per net ton, tidewater.

Finished Iron and Steel.—Although the mills have not yet shortened their output materially, being still at nearly 70 per cent. capacity on the average, it is principally due to the business originating in the West. Except in structural lines, this territory is not active, and even that showing, good as it is, is likely to be overshadowed by some very large projects developing in the Western part of the country. The unplaced structural contracts and those on which bids will shortly be taken in New York and vicinity make an attractive total, but the tonnage closed last week was considerably behind the records of recent weeks. Plates and bars, both iron and steel, are less fortunate even in prospects, and it is probable that April will close considerably behind the previous month. Prices, however, are as firm as ever, for it is felt that no lower profitable prices could be made, and that they would bring out no additional business. Labor troubles looming up in the boiler and tank trades induce employers to keep their stocks low, particularly as there is no delay in getting material as fast as it is needed. The principal structural awards during the week were the loft for Henry Corn at Fifth avenue and Twelfth street, New York, 4000 tons, to the Hay Foundry & Iron Works; the Henry Heide candy factory, New York, 2200 tons, to Post & McCord; the Black, Starr & Frost building, Fifth avenue, New York, 1100 tons, to the American Bridge Company; the bar and puddling mill for the Reading Iron Company, Reading, Pa., 800 tons, to the McClintic-Marshall Construction Company, and a crane runway, 100 tons, at the same plant to the Pennsylvania Steel Company; 600 tons of bridge material for viaducts in the suburban area of the New York terminal of the New York Central, to the Fort Pitt Bridge Company; a loft at 117 East Twenty-fourth street, New York, 400 tons, to Levering & Garrigues; a building for the Liberty Storage Warehouse Company on West Sixty-fifth street, New York, 400 tons, to the Radley Steel Construction Company, and a grandstand in the baseball park at Washington, D. C., 400 tons, to Brown & Ketchum. The New England Structural Company will probably get the 600 tons of bridge material for the Boston & Albany. Awards are expected shortly on 600 tons for the Boston Elevated Railway for substations, and 200 tons of bridge material for the Delaware & Hudson. Bids closed April 24 on the 1200 to 2000 tons for the Essex County Bank Building, Newark, N. J. The time for receiving bids on the Interborough Rapid Transit Company's improvements to the elevated structures in Manhattan is understood to have been extended, and it is not expected that awards will be made for some little time. The work will require 80,000 tons in all, and is divided in 10 sections, the largest one of which will need 23,000 tons. The Thompson-Starrett Company has the general contract for the Woolworth Building, the plans for which have been filed. Those for the new building for the New York Telephone Company on Walker street, New York, have been approved by the Building Department, and bids will probably be asked in about two weeks. It is estimated that between 4000 and 5000 tons of steel will be required. The Chesapeake & Ohio is in the market for several small bridge spans aggregating about 1000 tons, and the Boston & Maine has another inquiry out for a double track bridge at Groton, Mass., of about 75 tons. April 28 bids will close on between 500 and 700 tons for another section of work in the New York Central terminal area. Quotations remain unchanged, as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.40c. to 1.45c., all New York. Plain material and plates from store, New York, 1.85c. to 1.95c.

Pig Iron.—The reduction of 50c. in the price of Lake Superior ores and the announcement that Eastern ores have sold at from 25c. to 35c. a ton below the basis of 1910, have been factors in the pig iron market of the week. However, business has not been at a standstill, the end of last week bringing a number of orders to local offices in lots of 500 tons and less. The largest single transaction reported was 1500 tons. The inquiry for 4750 tons of foundry iron from a railroad supply interest has not yet resulted in business, but it may be closed this week. New England buyers seem to be pretty well covered for the next few months, but several interests in the New York district are expected to be in the market within a month for iron on which shipments will probably begin in June. Inquiries for iron for the third quarter are met with quotations as low as those for early delivery in some cases, and, while it is recognized that the pig iron market some time ago reached a level corresponding to the new ore prices, the sentimental effect of the reduction in ore may operate to project prompt delivery prices well into the last quarter of the year. Erie

Canal navigation opens May 15 and the first boat deliveries of Buffalo iron in this district will not be made before the early part of June. Buffalo prices vary, \$14 being the minimum with some furnaces for delivery in the third quarter, while in other cases this is shaded considerably. Buying of pipe iron continues, but the basic iron market is very quiet. We quote for early delivery, at tidewater, as follows: Northern No. 1 foundry, \$15.75 to \$16; No. 2 X, \$15.25 to \$15.75; No. 2 plain, \$15 to \$15.25; Southern No. 1 foundry, \$15.50 to \$15.75; No. 2, \$15.25 to \$15.50.

Steel Rails.—Among the week's sales reported by the leading interest are 5000 tons for the Philadelphia & Reading and 5000 tons for the Baltimore & Ohio, which will be rolled at Pittsburgh, and 3000 tons for the Chicago, St. Paul, Minneapolis & Omaha. The St. Paul's order, of which there has been some advance talk, will probably not be placed for several months.

Ferroalloys.—Inquiries are out for some fair-sized quantities of ferromanganese, but the market is not particularly strong. Dealers are quoting around \$36.50 for ferromanganese at seaboard. Ferrosilicon is very quiet, and it is quoted by New York dealers at \$53 to \$54, Pittsburgh.

Old Material.—If possible, business in this line is in even more deplorable shape than at the time of our last report. Dealers are not only contending with rejections by steel companies and rolling mills, but are experiencing cancellations of contracts which they had good reason to suppose would be complied with because of the high standing of the companies concerned. The most important transaction of the week, as far as could be ascertained, was the sale of 1000 tons of cast scrap. Nothing is moving in heavy melting steel scrap but a few moderate shipments on old orders, and even these are being made with trepidation for fear of rejections. While the nominal quotation of \$13, delivered eastern Pennsylvania, is being made by dealers in that section, it is the almost invariable experience of New York shippers that rejections and claims of allowances for slight departures from rigid specifications will involve a reduction in the price received of at least \$1 a ton. Dealers' quotations are as follows, per gross ton, New York and vicinity:

Old girder and T rails for melting	\$10.00 to \$10.50
Heavy melting steel scrap	10.00 to 10.50
Relaying rails	20.00 to 21.00
Standard hammered iron car axles	21.00 to 21.50
Old steel car axles	15.50 to 16.00
No. 1 railroad wrought	12.00 to 12.50
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.00 to 11.50
No. 1 yard wrought, short	9.50 to 10.00
Light iron	5.00 to 5.50
Cast borings	5.00 to 5.50
Wrought turnings	5.50 to 6.00
Wrought pipe	10.00 to 10.50
Old car wheels	11.50 to 12.00
No. 1 heavy cast, broken up	11.00 to 11.50
Stove plate	8.50 to 9.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	10.00 to 10.50

The Joseph Joseph & Brothers Company, old material, will remove May 1 from 100 Broadway to rooms 1454-6-8 on the fourteenth floor of the Hudson Terminal Building, 50 Church street, New York.

Metal Market

New York, April 26, 1911.

THE WEEK'S PRICES

Cents Per Pound for Early Delivery.							
Copper, New York.		Tin.		Lead.		Spelter.	
April.	Lake.	Electro-lytic.	New York.	New York.	St. Louis.	New York.	St. Louis.
20....	12.37½	12.12½	42.35	4.45	4.30	5.50	5.30
21....	12.30	12.00	42.30	4.45	4.30	5.50	5.30
22....	12.30	12.00	....	4.45	4.30	5.50	5.30
24....	12.37½	12.12½	42.85	4.42½	4.27½	5.50	5.30
25....	12.37½	12.12½	42.50	4.42½	4.27½	5.50	5.30
26....	12.37½	12.12½	42.50	4.42½	4.27½	5.50	5.30

More copper was sold in the past week than in any other week in the last six months. Large sales of electrolytic were made under 12c., but the market has since strengthened. Spot tin is below the import parity, but consumers are neglecting it. Lead is dull and lower. Spelter is very quiet. Antimony is in better demand and is stronger.

Copper.—Beginning last Friday, one of the biggest buying movements in copper recorded in many months took place. Sales were made at varying prices. The movement was precipitated by offerings of large amounts of copper at resale by holders who do not as a rule appear as sellers. This copper was offered in several blocks and from 400,000 to 1,000,000 lb. of electrolytic was disposed of at 11.92½c. Another offering of a block of 750,000 lb. was taken up at 12c., and 500,000 lb. of lake was sold for 12.12½c. After these resale offerings were contracted for the market assumed a stronger tone. Representatives of large brass manu-

THE IRON AND METAL MARKETS

facturers and important sheet copper producers had been bidding for the bargain copper and they at once looked elsewhere to fill their wants. A number of people were also asking for quotations on large lots for export. In consequence, when the market opened on Monday, consumers appeared very anxious to buy. The morning cable from London showed that quotations there on spot copper had advanced 11s. 3d. and this added to the excitement. Heavy sales were made for both export and domestic consumption at around 12.12½c. for electrolytic and 12.35c. for lake. Yesterday the United Metals Selling Company came out with an announcement that it would accept 12.12½c. for electrolytic and 12.37½c. for lake for spot delivery. This announcement seems to fix the price for other sellers, and considerably more copper was sold on that basis. It would be hard to estimate how much has been sold in all, as a great deal was disposed of for export, which will not be accounted for for some weeks. The deliveries of copper into export so far this month have been very heavy, amounting in all to 25,155 tons. The United Metals Selling Company, it is understood, has changed its policy of naming a price for electrolytic and holding it for some length of time, but will be governed by market conditions. The London market to-day closed steady, with spot quoted at £54 2s. 6d. and futures £54 15s.

Waterbury Average.—The Waterbury average for March was 12.50c.

Pig Tin.—The pig tin market is dull and flat, but it is favorable to the consumer, as plenty of tin is offered in this market at below the cost of import. The market advanced 55 points on Monday on the strength of reports that the shipments from the Straits for April would be very small, a conservative estimate placing them at 3000 tons. This information caused heavy buying in London, but had little effect on the market here. Consumers seem to be well supplied for the time being, and they are not taking enough interest as a rule to even inquire the price on future deliveries. The London market to-day closed dull, with spot quoted at £194 15s. and futures £190 10s. Spot tin sold in New York this afternoon at 42.50c.

Tin Plates.—The tin plate makers are busy delivering on contracts placed several weeks ago by the can manufacturers. The demand from the general manufacturing field improved slightly during the week, but, on the whole, consumers are buying very cautiously. Quotations are unchanged at \$3.94 for 100-lb. coke plates. The price of foreign tin plates is 3d. lower than it was a week ago, the quotation at Swansea, Wales, now being 14s.

Lead.—Lead is quiet and barely steady. The market weakened perceptibly Saturday, and the metal is now offered both here and in East St. Louis at 2½ points less than a week ago. It can be bought from independent sellers in St. Louis for 4.27½c. and in the New York market at 4.42½c.

Spelter.—Everything seems to be against spelter just now. The galvanizing interests are not particularly busy, and they seem to have enough stocks on hand to carry them along. Other consumers appear to have little faith in the present price of the metal, as they are buying only in small lots as they need it. The asking price is unchanged, and spot spelter can be had in New York at 5.50c. and in St. Louis for 5.30c. These prices are only nominal, it being very apparent that they can be shaded in some quarters.

Antimony.—Some leading manufacturers of Chinese antimony have entered into an agreement with the European syndicate, with the result that quotations have stiffened. The syndicate is playing a waiting game, as antimony can be bought in this country at less than the cost of import. The operators are apparently keeping their prices up, and expect to get their figure after the surplus stocks here have been disposed of. There has been some rather heavy buying of Hallett's and Chinese and Hungarian grades, with the result that the price of Hallett's has advanced again to 9c. Cookson's is held very firmly at 9.50c. and the Chinese and Hungarian brands are bringing various prices from 8.30c. up. There is still a good quantity of antimony available at resale, but the market has an advancing tendency.

Old Metals.—The demand is still reported light by dealers, whose selling quotations are unchanged as follows:

	Cents.
Copper, heavy cnt and crucible.....	11.75 to 12.00
Copper, heavy and wire.....	11.50 to 11.75
Copper, light and bottoms.....	10.75 to 11.00
Brass, heavy.....	8.00 to 8.25
Brass, light.....	6.75 to 7.00
Heavy machine composition.....	10.50 to 10.75
Composition turnings.....	8.75 to 9.00
Clean brass turnings.....	7.75 to 8.00
Lead, heavy.....	4.20 to 4.25
Lead, tea.....	3.95 to 4.00
Zinc scrap.....	4.25 to 4.30

Metals, Chicago, April 25.—No sales of consequence have been made the past week, and the recent talk of the probability of an advance in copper seems to have been

forgotten. Tin, however, is very erratic and has jumped from 42¾c. to 44c., at which figure it is now being quoted. Business in lead is light, as is the case with spelter and other metals. Some business is being done in old metals at a sacrifice in prices. We quote Chicago prices as follows: Casting copper, 12½c.; lake, 12¾c., in carloads, for prompt shipment; small lots, ¼c. to ½c. higher; pig tin, carloads, 44c.; small lots, 45¾c.; lead, desilverized, 4.40c. to 4.45c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c., per 100 lb. higher; spelter, 5.35c. to 5.40c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is \$7.25, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10¼c.; copper clips, 12c.; red brass, 10¼c.; yellow brass, 9c.; lead pipe, 4¾c.; zinc, 4¼c.; pewter, No. 1, 27c.; tin foil, 32c.; block tin pipe, 35c.

Metals, St. Louis, April 24.—Lead is quiet at 4.30c.; spelter is dull at 5.30c., both at East St. Louis. Zinc ore is lower, being quoted at \$35 to \$38 per ton, Joplin, base. Tin is easier at 42.55c.; antimony (Cookson's) a shade lower at 9.80c.; lake copper unchanged at 12.72½c.; electrolytic unchanged at 12.47½c., all at St. Louis. The demand for finished metals the past week was moderate.

Iron and Industrial Stocks

NEW YORK, April 26, 1911.

Prices of stocks have generally shown a declining tendency. The long delay in handing down the important Supreme Court decisions is affecting the nerves of holders of securities. In some stocks the decline has been marked. A notable exception was International Harvester common, which made a sharp advance. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.....	7%	Pressed St., com.....	31% - 32
Allis-Chalm., pref.....	25 - 28½	Railway Spr., pref.....	99%
Beth. Steel, com.....	31% - 33	Republic, com.....	30% - 32
Beth. Steel, pref.....	61 - 62½	Republic, pref.....	93 - 94
Can. Com.....	9% - 9%	Sloss, com.....	40 - 51
Can. pref.....	82 - 83%	Pipe, com.....	16%
Car & Fdry, com.....	50% - 52%	Pipe, pref.....	54% - 55%
Car & Fdry, pref.....	114% - 115	U. S. Steel, com.....	72% - 76%
Steel Foundries.....	43% - 44%	U. S. Steel, pref.....	118% - 119%
Colorado Fuel.....	28% - 30	Westinghouse Elec.....	64% - 65
General Elec.....	148% - 152	Va. I. C. & C.....	50
Gr. N. ore cert.....	58% - 61%	Chl. Pneu. Tool.....	49 - 51
Int. Harv., com.....	115% - 118%	Cambria Steel.....	45 - 46%
Int. Harv., pref.....	124	Lake Sup. Corp.....	27% - 28%
Int. Pump, com.....	38% - 39%	Pn. Steel, pref.....	104% - 109%
Int. Pump, pref.....	87%	Warwick.....	10%
Locomotive, com.....	35% - 37	Crucible St., com.....	12 - 12%
Locomotive, pref.....	104 - 105	Crucible St., pref.....	76 - 77%
Pitts. Steel, pref.....	103% - 104		

Dividends.—The International Harvester Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable June 1.

The Pennsylvania Steel Company has declared the regular semiannual dividend of 3½ per cent. on the preferred stock, payable May 1.

The Ashton Valve Company has declared the regular quarterly dividend of 1½ per cent., payable May 15.

The United States Steel Corporation has declared the regular quarterly dividends of 1¼ per cent. on the preferred stock, payable May 29, and 1¼ per cent. on the common, payable June 29.

The Cambria Steel Company has declared the regular quarterly dividend of 1¼ per cent., payable May 15.

The J. G. Brill Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable May 1.

Notes on Prices

Rope.—The demand still lags, not showing the improvement that was expected to be evidenced by this time. Prices are fairly well maintained on the highest grades of manila and sisal rope, while lower grades of both are subject to more or less variation from regular quotations. The following quotations represent regular prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure manila of the highest grade, 8½c. to 9c. per pound; second grade manila, 7½c. to 8c. per pound; hardware grade, 7c. to 7½c. per pound; pure sisal of the highest grade, 6½c. per pound; second grade, 6c. per pound; rove jute rope, ¼-in. and up, No. 1, 6½c. to 7c. per pound; No. 2, 6c. to 6½c. per pound.

Linseed Oil.—The demand is light, but the market is slightly firmer in carload lots, in sympathy with the stronger position of both domestic and foreign flaxseed. Large buyers are holding off making contracts because of high prices and uncertainty of the future market, while crushers are not sure of being able to secure seed against orders for future delivery. The New York quotation for carload lots

is about 88c. to 90c. per gallon for raw oil. The following are New York prices in 5-barrel lots or more:

	Cents.
State, raw.....	91
City, raw.....	91
Oil in lots of less than 5 bbl., 1 cent advance per gallon.	
Boiled oil, 1 cent advance per gallon over raw.	

Naval Stores.—The turpentine market is a little higher at this point than it was last week, owing to the fact that buying is quite active in Savannah. The demand has improved in the number of small lots which have been taken by manufacturing consumers. The high prices have also stimulated the sale of turpentine substitutes, correspondingly reducing the sale of the genuine article. New York turpentine quotations in 5-barrel lots are as follows:

	Cents.
In oil barrels.....	78
In machine barrels.....	78½
Less than 5-bbl. lots, ½ cent advance per gallon.	

A fair business has been done in rosins in New York. On the basis of 280 lb. to the barrel, common to good strained is quoted at \$8 and grade D at \$8.20 in the New York market.

La Belle Improvements Deferred

At the monthly meeting of the Board of Directors of the La Belle Iron Works, held on Tuesday at Steubenville, Ohio, it was decided not to go ahead for the present with the building of the eight new sheet mills and two new jobbing mills, the erection of which has been under consideration for some time. The unsatisfactory outlook for business is the reason assigned for the deferring of this work. Wilmer Wickersham, who resigned recently as sales agent of the Pope Tin Plate Company, Pittsburgh, has become associated with the La Belle Iron Works in the sales department.

American Iron and Steel Institute

President E. H. Gary of the American Iron and Steel Institute and the directors and chairmen of committees held a luncheon meeting at the Railroad Club, New York, Wednesday, April 26. The committee which has under consideration plans for establishing as far as possible a six-day week for labor in the iron and steel industries held a preliminary meeting Wednesday morning. It consists of Wm. B. Schiller, E. A. S. Clarke, F. W. Wood, James A. Campbell and Geo. G. Crawford.

The Orenstein-Arthur Koppel Company, for its extensive additions at Koppel, Pa., has just placed with Tate, Jones & Co., Inc., Pittsburgh, Pa., a contract for the complete oil burning equipment and furnaces, consisting of pumping system, large rivet forges, open forges, forging furnaces and pipe bending furnaces.

The Phillips Sheet & Tin Plate Company, whose general offices are at Weirton, W. Va., has opened a sales office in 910 Morris Building, Philadelphia, Pa. Howard M. Davis, well known in the sheet and tin plate trades, is in charge of the office, and will look after the territory.

The Baldwin Locomotive Works, Philadelphia, Pa., has received orders this week for 25 heavy Mikado freight engines for the Southern Railway and 25 of the same type for the Cincinnati, New Orleans & Texas Pacific Railway.

The new plant of Koppers by-product coke ovens recently under construction for the Woodward Iron Company, Woodward, Ala., was started up last week. There are 60 ovens, having a capacity of 700 tons of coke in 24 hours.

Rowland Firth & Son, Phillipsburg, N. J., will add a steel foundry to their present plant. A 10-ton open hearth fuel oil furnace will be installed. Orders for the buildings and equipment will be placed in two weeks.

The Olive Foundry & Machine Company, Ironton, Ohio, has bought the patterns and good will of the Cincinnati Punch & Shear Company, Cincinnati, Ohio.

Tropenas Converter with Double Door Bottom

The Tropenas Converter Company, New York, recently transformed a crucible steel foundry into a converter foundry without suspending operations. Up to February 21 the Union Steel Casting Company, Boston, was making small steel castings by the crucible process, having four batteries of 10 crucibles each. To make room for the converter two of the furnaces were torn out, while the other two remained in continuous operation. On February 22 the plant was shut down, the finishing touches were put to the new equipment, and on February 23 the first blow was made, which proved to be perfectly satisfactory.

One of the main reasons for changing from the crucible to the converter process was the high price of the finished product due to the cost of crucibles, the company's allowance for this item being an average of 1 cent per pound. As against a monthly crucible bill of \$600 for a small foundry, the necessary repairs to the lining of a small converter are put at less than \$100 a year.

After 100 blows of the new "baby" converter, only one casting weighing a few ounces was returned. Tests showed also that the converter steel met the specifications readily and most of the time exceeded them.

With the installation of this Boston plant the Tropenas Converter Company brought out its new drop bottom converter. The criticism had often been made that in a one piece converter it was practically impossible to cool the lining quickly enough after a day's blowing, so as to allow a man to enter the converter the next morning and do the necessary patching. For a foundry wanting to cast every day it meant that a second converter had to be installed. Finally A. Tropenas, inventor of the process, thought of equipping the converter with a double door bottom, similar to that in use on the cupolas of iron foundries. The plan had been tested out in Europe, but the converter in Boston was the first one of this kind in the United States.

The procedure is as follows: After blowing, the bottom doors are dropped and the lining forming the bottom of the converter is knocked out. The opening thus created allows the air to circulate freely and the converter is perfectly cold every morning. To use the converter again the doors are closed, a special composition bottom lining rammed up on top of them, and by the time the converter is heated enough to receive the iron the bottom is entirely dried out. The new bottom has an added advantage in leaving a very large opening through which a man can enter the converter and do the necessary patching without being cramped for room.

The Union Steel Casting Company makes a specialty of very small castings and employs only 12 molders. The following is the daily schedule:

7.00 a.m., arrival of workmen.			
7.00 a.m. to 7.45 a.m., patching up of converter and cupola.			
7.45 a.m., fire started in converter.			
8.15 a.m., fire started in cupola.			
10.25 a.m., blast on cupola.			
10.45 a.m., first tap from cupola.			
No. of blow.	Blow started.	Blow ended.	Duration of blow.
1.....	10.54 a.m.	11.05 a.m.	11 min.
2.....	11.24 a.m.	11.35 a.m.	11 min.
3.....	11.57 a.m.	12.08 p.m.	11 min.
4.....	12.28 p.m.	12.38 p.m.	10 min.
5.....	12.59 p.m.	1.09 p.m.	10 min.
6.....	1.30 p.m.	1.40 p.m.	10 min.
7.....	2.02 p.m.	2.12 p.m.	10 min.
8.....	2.35 p.m.	2.45 p.m.	11 min.
3.00 p.m., pour off.			
3.00 to 5.00 p.m., molders resume molding and laborers shake out molds and temper the sand.			

The approximate capacity of the newly installed converter is 1200 lb., making the amount of steel poured in a day 9600 lb., all taken out of the converter in bull ladles.

The Orenstein-Arthur Koppel Company, manufacturer of industrial, narrow and standard gauge railroad materials, has moved from its old quarters in the Monadnock Building to 631-633 People's Gas Building, Chicago.

Some Unsolved Problems in Electroplating*

BY GEORGE B. HOGABOOM.†

As is well known, electroplating was the beginning of the science of electrochemistry, but it has lingered by the wayside and been neglected as a science, and to-day the unsolved problems are many.

Electroplating has been looked upon more as a trade than a science, and it is only during recent years that much study has been given to it by scientists, and that attention has been directed more to the electrolytic refining of metals than to the deposition of metal for decorative purposes. The solutions published by Roseleur in 1854 have been improved upon but little, and those who have published treatises upon the subject often give only a repetition of his formulas. Nickel-plating, as invented, by Dr. I. Adams, is probably the only exception.

The field is broad, but its development has been left to the practical man, guided only by rule of the thumb. An electrochemist in the plating room of a factory is so rare that it probably can be said without fear of contradiction that they can be counted on the fingers of one's hands. The need to-day is mutual assistance in solving these problems and developing of new ideas. To a great extent they are useless each without the other—the plater producing results which he cannot duplicate—the electrochemist creating solutions that are not a commercial success.

So many phenomena have been encountered that to include the perplexing problems would necessitate a history of nearly every known solution and finish. The varying of the temperature and the electric current often proves a stumbling block, and these conditions cannot always be controlled. There is a vast difference between producing a homogeneous deposit at a minimum cost from a solution where the amount of cathode surface is being changed every 20 minutes, and a solution in which the amount of cathode surface is always the same and the rapid deposit of the metal is more desired than a deposit that can be easily burnished. Such would be the difference, for instance, between the surface of a sheet of electrolytic copper and that of a cast lead and antimony electrolyzer with its deep reliefs and where a coarse crystalline structure would destroy its beauty. In the discussion of electroplating problems, it must be borne in mind that a mere deposit of a metal is not all, but that the deposit must be soft and smooth and lend itself to a decorative process; the anodes should be capable of being reduced easily; the electrolyte must offer little resistance to the electric current, and, last, but not least to the plater, who hears it so often that it becomes a part of him, the cost must be nominal.

Difficulties with Several Metals

The automobile industry has brought about, more than anything else, the need of a heavy deposit of brass. At present this is done in a solution of cyanide of copper. The deposit is not only slow, but unsatisfactory, because of what is known as spotting out—a discoloration in spots which appears on the work after it has been polished and lacquered. Deposits on cast metal give the most trouble. It is probably caused by the acids or alkaline solutions being absorbed in the pores of the metal, or in the small blow-holes, and the deposit covering these holes partially, leaving minute holes through which the solution oozes out. Several remedies have been suggested and tried, such as boiling out in some neutralizing chemical solution or placing in a drying oven for several days, but a satisfactory remedy has not been found. An acid brass solution would be a great advantage. There is an acid copper and an acid zinc solution, but no acid brass electrolyte. The difference between the deposit from a cyanide and a sulphate of copper solution

well illustrates the advantage of having an acid brass solution.

The formula for a tin solution published by Roseleur is the most generally used to-day, as little, if any, improvement has been made upon it, although a good solution, which would give a heavy deposit, is much desired. In Roseleur's solution the electrolyte is not replenished by the anode, but by the constant addition of a concentrated solution. This should be overcome, and would be appreciated by manufacturers of tinware. While several solutions have appeared from time to time for plating upon aluminum, none of them is in general use, and a good electrolyte that would deposit gold, silver, brass or copper, so that it would stand burnishing and not peel off in time, could be used. The successful removal of a deposit of nickel from another metal without affecting the latter has not been accomplished.

Unsolved Problems

To give all the unsolved problems in detail would make a lengthy paper, and a simple statement of those most desired will be given: An electrolyte that will remove the fire-scale from brass; also one that will produce a bright or a matte surface in place of using the present acid dips; and electric cleaner that will saponify the grease and take it into solution instead of driving it to the top, where it has to be constantly removed to prevent it adhering again to the work as the latter is removed from the solution; a heavy deposit of lead on the inside of iron pipes, to prevent rapid corrosion; a method to coat electrogalvanized iron or steel with decorative metals without destroying the rust-resisting properties of the zinc; an alkaline nickel-silver solution that can be worked with a low voltage; a method of etching steel without destroying a resistance film of gelatine; some alkaline substance that would replace cyanide of potassium. This would be universally welcomed.

For the above suggestions, the writer is indebted to 100 different platers, who were kind enough to answer a request for unsolved problems. It may be interesting to note that 80 per cent. of them requested an acid brass solution.

Lawrence Brothers, manufacturers of hardware specialties, Sterling, Ill., have begun construction work on their new plant. Local workmen will be employed under the direction and supervision of Raeder & Wood, 77 Jackson boulevard, Chicago. A warehouse and office building, 84 x 164 ft., five stories, and a main factory building, 108 x 160 x 420 ft. will be erected. The buildings will be of reinforced concrete construction throughout.

The Dakota Portland Cement Company, Sioux Falls, S. D., states that the construction of its plant at Chamberlain, S. D., is well under way, and that it is expected to be ready for operation about November 1. It will have a daily capacity of 2500 to 3000 barrels. The buildings are of steel and concrete construction, and together with the terminals cover an area equal to 12 acres. The company owns its own terminals, and will operate its own locomotives.

The Empire Iron & Steel Company, Niles, Ohio, has spent a large amount of money recently in improving its various departments. The electric plant has been enlarged by installing a 300-hp. engine and a 220-kw. generator. Additions have been made, which will materially increase the output of all forms of metal roofing, conductor pipe, eaves trough, &c. The puddling furnaces enable a product to be made, which is exactly like the old-fashioned iron of 50 years ago.

The statistics of the American Railway Association show that on April 12 the net surplus of idle cars on the railroads of the United States and Canada was 186,053, compared with 194,887 two weeks previous. The number of idle cars April 12 was about 100,000 more than on the corresponding date in 1910.

* A paper presented before the American Electrochemical Society, New York, April 6 to 8, 1911.

† Secretary of the National Electroplaters' Association.

Personal

Warren J. Lynch has been appointed vice-president of the American Steel Foundries, taking charge of sales and traffic. He is now passenger traffic manager with the Lake Shore & Michigan Southern Railroad, and is expected to take up the duties of his new position about May 1, establishing his office in New York City.

Walter S. Timmis, consulting engineer, has removed his offices to the Marbridge Building, Herald Square, New York City.

J. H. Keefe has been appointed assistant general manager of the Gulf, Colorado & Santa Fé Railway Company, effective May 1, with headquarters at Galveston, Texas. In addition to his present duties he will have direct charge of transportation matters pertaining to export, import and coastwise traffic.

William A. Spear has taken a position with the sales department of the Waterbury Farrel Foundry & Machine Company, Williamson Building, Cleveland, Ohio.

The offices of W. E. Corey have been removed this week from 30 Church street to 111 Broadway, New York, and are in charge of James H. Slocum, who has been Mr. Corey's private secretary for a number of years. Mr. Corey will return from Europe in July.

A. W. Grier, for seven years connected with the order and shipping department of the Carnegie Steel Company, at Pittsburgh, Pa., and four years with the California Industrial Company, Los Angeles, Cal., has opened an office at 518 Higgins Building, Los Angeles, as manufacturers' representative in iron and steel products.

W. N. Pratt, general superintendent of the North Works, Illinois Steel Company, Chicago, has returned from California after an absence of two months.

H. A. Stillwell of the machinery selling firm of Charles Churchill & Co., London, England, has returned home after a visit among American machinery manufacturers.

C. W. Beaver, who is connected with the hoist department of the Yale & Towne Mfg. Company, 9 Murray street, New York, has returned from a four months' stay in Europe on business connected with the export department of the company.

Louis Renault, Paris, France, who conducts one of the largest French automobile manufacturing plants, is in this country visiting machine tool and automobile manufacturers.

John G. Wright, Eastern manager of the Hooven-Owens-Rentschler Company, has returned from a stay in Porto Rico.

Carl Hering, Philadelphia, Pa., presented a paper at a meeting of the electrical section of the Franklin Institute in that city on the evening of April 20, on "The Electric Furnace," which was illustrated with a large number of lantern slides showing the various types of electric furnaces used in the manufacture of iron, steel, aluminum, alloys and chemical products.

Charles A. Moore of Manning, Maxwell & Moore, New York, is seriously ill in Egypt, where he has been for some time.

J. L. Straub, secretary of the J. S. Bretz Company, New York, sailed Tuesday on his annual trip abroad to visit the plants which produce the goods his company markets here. Among these are the ball bearing plant of Fichtel & Sachs, Schweinfurt, Germany; the Fries & Hopfinger ball making shops in the same town; the electrical laboratories of Unterberg & Helmle, the producers of the U. & H. master magneto, Durlach, Germany, and wire interests in London, England.

The Colonial Steel Company announces that Frank C. Lewis, who has had charge of the Chicago warehouse and office for a number of years, has resigned to take up other lines. James S. Lewis will be associated with him. Ralph D. Van Valkenburg, formerly sales agent for the Taylor Iron & Steel Company, at Scranton, Pa., has been appointed district manager of the Chicago office of the Colonial Steel Company, and will take charge of his duties at once.

Obituary

MILLARD F. WILFONG, president of the M. F. Wilfong Iron Works Company, Philadelphia, Pa., died April 9, at Ocean City, N. J., after a short illness. He had been engaged in the manufacture of stacks, tanks, &c., in Philadelphia for nearly 40 years.

SAMUEL JOHNSTON, inventor and manufacturer of harvesting machinery, died at the home of his daughter in Buffalo April 18, aged 76 years. In the early '60s he invented his first successful reaper at Buffalo, where he was associated with the Howards in their iron works. From Buffalo he went to Syracuse and was associated with Bradley & Co. in 1865. In 1868 he went to Brockport, N. Y., and organized the firm of Johnston, Huntley & Co., and began the manufacture of the Sweepstakes reaper. In 1870 the Johnston Harvester Company was organized and a large plant built; this was destroyed by fire and the company then moved to Batavia. In recent years Mr. Johnston made a study of high temperature furnaces, and was engaged in this work up to the time of his last illness.

THOMAS F. STEVENSON, for many years an importer of machinery at Shanghai, China, died April 19 in Brooklyn, N. Y., aged 72 years.

EDWARD H. WARDWELL, secretary of the Barrett Mfg. Company and of the United States Gypsum Company, and a director of the American Coal Products Company, died April 22, at his home in New York City, aged 69 years.

ACHILLE A. DREYFUS disappeared some time ago, and his body was found April 15 in the East River at the foot of Eightieth street, New York. Mr. Dreyfus had for several years been an importer of steel, and recently had been conducting the Royal Metal Steel Company, New York, handling French tool steel. It is presumed that he had committed suicide while in a state of mental aberration. He leaves a widow and two children.

CHARLES W. GOODYEAR died at his home in Buffalo, N. Y., April 16, aged 65 years. He was president of the Buffalo & Susquehanna Railway Company, Buffalo, Utica & Attica Railway Company, Powhattan Coal Company, Buffalo & Susquehanna Coal & Coke Company, Goodyear Lumber Company and Great Southern Lumber Company, and was interested with Wm. A. Rogers, Hugh Kennedy and S. M. Clement in the organization of the Buffalo & Susquehanna Iron Company, which a year ago was merged with the Rogers-Brown Iron Company in the operation of blast furnaces in Buffalo and the development of coal and coke fields on the Goodyear properties in Pennsylvania.

The Bontempl Rust-Proofing Company, 111 Broadway, New York, has issued a pamphlet describing the process of rust-proofing patented by Augusto Bontempl. The articles to be treated are placed in a muffle, and after being heated are subjected to the fumes of a chemical compound which, it is stated, can reach a thickness or depth of 1-16 in. or more of oxide, depending on the time of treatment. Furnaces have been installed by the Eastern Rust-Proofing Company, as licensee of the process in the Blanchard Building, Borden avenue, Long Island City, N. Y., for the treatment of any product to which the process is applicable.

The exportation of high-grade steel sheets from the United States is probably something new. A few weeks ago the West Penn Steel Company sent samples of its first quality open hearth pickled and cold rolled material to England, orders resulted and specifications are now being executed at the works of the company at Brackenridge, Pa.

The thirty-sixth annual convention of the Amalgamated Association of Iron, Steel and Tin Workers will be held in Canton, Ohio, starting May 2. The Wage Committee will meet there on Friday of this week to draw up a tentative wage scale for puddling and finishing mills to be presented to the regular convention.

American Export Methods

A Detroit Manufacturer Finds Many Points in Which They Fall Short

Wm. C. Redfield, second vice-president of the American Blower Company, Detroit, Mich., started last November on a trip around the world to study foreign markets with a view to developing business for his company. From one of his recent letters to the home office, written at Calcutta, March 21, the following extracts are taken which are of value in indicating what is to be guarded against both by sales and shipping departments of exporting firms:

"I have now traversed Japan, the Philippines, Hong Kong, Java, the Straits Settlements and Burmah to India. This covers the possessions of the United States, Holland and Great Britain in the East, as well as Japan. I cannot say that thus far I have found any prejudice against American goods. Indeed, certain classes of American products have been everywhere in evidence. Among these are sewing machines, typewriters, toilet articles and soaps, locomotives (in Japan) and petroleum products. These are precisely those that have been most carefully and steadily brought before and kept before the attention of buyers in these various lands. I ought also to add that American cameras and photographic supplies were everywhere except in Java; there no films of any kind could be had, only plates. In many stores, finding one article selling, I would ask why not such and such another, only to find simply that they did not know of it, and in some cases to have a note at once made of it.

"I have run across horrible neglect in packing, even after attention was called to it. In one case oil stoves were formerly bought in America and the American product was conceded better, but, after warning, the American goods were so badly shipped that one-half of one shipment arrived broken. Now the dealer buys in Europe and pays a higher price. He told me he did not want to do this but he had to, for American makers would not listen to him.

"Bitter complaint is made that American houses trust young, irresponsible boys to do their mailing instead of having some clerk of fair responsibility attend to this important service. The result is misaddressed letters, so that responses are not received, and the regular habitual neglect to prepay postage, causing extra charges.

"A large Boston house wrote to Manila June 8, and on June 25 followed it up with a sharp letter insisting on an immediate reply. A New York firm referred an inquiry from Panama to its Manila agent. These are some of the things that handicap Americans.

"I do not find prices to be the obstacle. Several American manufacturers I have met tell me their prices are lower than their European competitors. This is true of locomotives, for example.

"What I find chiefly needed to greatly enhance our export trade in America is knowledge—knowledge of geography, of the peoples, their ways and needs, their business methods.

"Foreign trade does not essentially differ in its basis from domestic trade. A man selling in Michigan studies Michigan needs, offers goods Michiganders want, tells about them in the way the good people of Michigan understand. If he does not do so the wise ones in Michigan turn him down. A man in larger trade does not assume that Texas and Florida use the goods that sell in Maine; he finds out what are wanted or not wanted and acts accordingly. You don't spend much on heating apparatus for Louisiana. And this is all there is underlying export trade; but because it is just outside the immediate horizon and men are busy, they often do not even inquire about it, and when they do and find that it takes time and care and patience they take the near and obvious and let the other go. In this way the trade of empires is neglected and great opportunities are lost.

"Sometimes houses 'peter out' and give up the game too soon to win. Two concerns came from America to India where the prejudice, not so much against American goods as in favor of English goods, is very strong.

One after six months began to reduce expenses, took a smaller office, then a still smaller one, then closed up. The other lost \$20,000 the first year. They had a good man on the spot and held on. The second year they came out even. The third year they got back the \$20,000. Then they got it back many times with interest, for they had means and courage to hold on."

Erie Canal Terminals on Lake Erie

At a meeting of the Barge Canal Terminal Commission in Albany, April 14, plans for the construction of the Erie Barge Canal terminals, at Buffalo and Tonawanda, N. Y., were decided upon, at an estimated cost of \$2,800,000. The principal Buffalo terminal will be in the Erie Basin, which is on the harbor from north of and adjoining the mouth of the Buffalo River, 3000 ft. in length by 600 ft. in width, comprising about 42 acres. This basin is to be improved, and is to have a uniform depth of 23 ft., to accommodate deep draft lake vessels. It will be supplied with three piers—400, 600 and 800 ft. long, respectively—each 100 ft. wide. The longest pier is to be provided with a warehouse of concrete and steel, 150 ft. long by 60 ft. in width, three stories high, equipped with suitable internal elevators and machinery. Power operated cranes, with all necessary apparatus, are to be built on all these piers for the transfer of cargoes from lake vessels to canal boats. The slip between the Erie Basin and the present Erie Canal will be enlarged and deepened.

The Ohio Basin, which is on Buffalo River, about 1 mile from its mouth, is also to be improved and deepened sufficiently to secure 12 ft. of water at all times and provided with a warehouse equipped with cranes and other appliances for the handling of freight in that vicinity. Another important improvement which the plan provides for is a terminal on the outer harbor with piers having rail connection with the Buffalo Creek Railroad—a terminal and transfer road in touch with all the railroads entering the city, permitting the transfer of freight from the canal to all railroads as well as to lake vessels. This outer harbor terminal is to be adjacent to the United States Government pier, known as the light house pier, and to be connected with the inner harbor and Erie Basin by a slip having a depth of 13 ft. at mean lake level and of sufficient width to provide for the passage of the largest barges which can navigate the improved Erie Canal.

The Pennsylvania Railroad Company has issued a book of instruction published in nine languages for the government of employees working on or about its tracks. The English portion covers three pages, and following it are translations into German, Greek, Hungarian, Italian, Lithuanian, Polish, Slovak and Swedish. Contrary to the general belief that the poorer classes of immigrants are very ignorant, those in charge of the Pennsylvania track gangs say that practically all the men can read, and that one is rarely found who cannot sign his name.

The Kelly Reamer Company, Cleveland, Ohio, at its annual meeting, April 15, elected William E. Kelly, Albert H. Weed, John M. Marty, Jr., Edward B. Jessup and J. W. Strain directors, who elected for the ensuing year the following officers: William E. Kelly, president; Albert H. Weed, vice-president; John M. Marty, Jr., secretary-treasurer. William E. Kelly was appointed general manager. The company reports a large increase in its business. On May 1 it will move into its new quarters, 1547 to 1565 Columbus road, N. W., Cleveland.

The Westinghouse Machine Company, Pittsburgh, Pa., has received an order from the Weymouth Light & Power Company for a 625-kw., single flow, high-pressure turbine to be installed in its power house at East Weymouth, Mass. The turbine will use steam at 150-lb. pressure, and will exhaust into a vacuum of 27 in., maintained by a Lelanc jet type condenser.

Mechanical Handling of Materials*

Ore Unloading Equipment and Its Great Reduction in Costs—How the Package Freight Problem of the Railroads May Be Solved

BY RICHARD DEVENS.†

Within the last few years some of our railroad, industrial and steamship companies have begun to realize the important part mechanical transference plays in the quick and economical handling of material. The most efficient advances have been made in the handling of bulk material, such as ore, coal and grain, while package freight, comprising boxes, barrels, bags and other packages, which make up the load of a freight car, or the cargo of a steamship, has just begun to receive serious consideration.

Early Advances in Iron Ore Handling

It is no doubt a fact that the proficiency in handling bulk material was due to the difficulties to be overcome in the transportation and handling of iron ore to the center of the iron industry. I have reference to the iron ore that was discovered in the Lake Superior country. The first problem was the transportation, and this was overcome in 1855 when the Federal Government completed its first system of locks at the falls of the St. Mary's River at Sault Saint Marie, Mich. The second problem was the loading and unloading of the vessel. The loading was readily accomplished by the building of a long line of pockets on a dock extending into the lake and the equipping of each pocket with chutes. The pockets were of such height that the ore would flow from them over the chutes and into the vessel by gravity. The railroad cars, of the bottom dump type, were brought over the top of the pockets and dumped into them.

It is interesting to note that the method used in the first loading dock is the one on which all docks have been constructed since. The unloading has been the most difficult to accomplish in a quick and economical manner. The first vessels to carry iron ore were not constructed for the purpose, and while they carried some ore in the hold, most of it was carried on deck. When it was carried in the hold, it was hoisted to the deck by horsepower, dumped into barrows; and then, like the deck cargo, wheeled ashore.

The next step was the substitution of a small hoisting engine for the horsepower. This early method was in operation many years, and it was not until the dock managers were forced into it by the great expense in carrying large storage on the dock, that any mechanical devices were attempted.

The First Machine for Ore Unloading

A cableway machine, built and erected at Cleveland, Ohio, in 1880, under Alexander E. Brown's design and supervision, was the first mechanical plant. The next machines were of the bridge type. The method of handling the iron ore, over either the cableway or bridge, was to fill iron buckets by hand in the hold of the vessel and then hoist them by the machine, and dump them automatically into railroad cars or storage. In the hold there were from 12 to 15 shovelers to each machine, and there were two men on the machine, one an operator and the other a fireman.

Both of the above equipments were a great improvement over the early methods, and handled the iron ore in a satisfactory manner; yet they did not cut down the cost of the hand labor in filling the buckets in the hold. This was a very large part of the cost of unloading. An automatic filling bucket had been worked successfully for a number of years in coal and similar soft material,

but on account of the hard and lumpy nature of the early iron ores it could not be operated in them.

The Grab Bucket Machine Greatly Lowers Cost

With the use of the soft Mesaba ores, interest in the automatic filling or grab bucket was renewed, and about 10 years ago the first successful grab bucket machines were erected and operated at the Illinois Steel Company's plant at Chicago by Hoover & Mason. This plant was designed to unload from the vessel direct into railroad cars. The success of this plant was the beginning of the present methods of unloading iron ore. There have developed two types of grab bucket machines—one with the grab bucket suspended from wire ropes and the other with the grab bucket carried on a rigid arm.

The cost of filling the buckets by hand was about 13 to 15 cents per gross ton, and the cost of hoisting and dumping into railroad cars or storage from 1½ to 2 cents per gross ton, making the total cost of unloading from 14½ to 17 cents. With the grab bucket machines, this total cost has been reduced to from 1 to 2 cents per gross ton, depending on the distance the ore is carried from the vessel.

The hand-filled buckets were of about 1-ton capacity, as this size had been found to be the most practical for filling and handling in the hold. With the grab bucket the size is only limited by the dimensions of the hatch and the shape of the vessel. The first grab buckets for iron ore were of 5 tons capacity, but since then machines have been built to handle 7½, 10 and 15 tons.

Besides reducing the cost of unloading the ability to handle in larger units has reduced the time. Whereas with the hand-filled buckets to unload a 6000-ton vessel was a question of days, it is now only a question of hours. The steamer Morgan of the Pittsburgh Steamship Company, with a cargo of 11,319 tons of ore, was recently unloaded at Fairport in 5 hours and 58 min. The work was done with six Brown electric unloaders.

Increased Number of Vessel Trips

These improvements have also increased the earning capacity of the vessel by making possible a greater number of trips during the season. This is seen in the following comparative statement for the years 1906 and 1910, showing the average stay at upper and lower ports of the vessels of the Pittsburgh Steamship Company:

	Year 1906.		Year 1910.	
	Hr.	Min.	Hr.	Min.
Average stay in lower lake ports.....	36	15	22	22
Average stay in upper lake ports.....	22	25	12	22
Average time spent in port receiving and discharging cargoes.....	58	38	34	44
	Gross tons.		Gross tons.	
Average cargo carried.....	5,954		6,634	
Largest cargo carried.....	13,333		13,296	
	In 70 min.		In 45 min.	
Fastest loading record.....	9,277		9,788	
	Tons		Tons.	
	per hour.		per hour	
Rate of fastest loading record.....	7,288		13,051	

Europe Ahead in Handling Package Freight

In the foregoing I have outlined the development of handling bulk material, using iron ore as an example. The handling of package freight has not been brought to the same degree of perfection. In many manufacturing concerns mechanical devices have been installed to reduce the cost of handling and to hasten the transportation of their products, but for quick and economical handling of freight at shipping docks and railroad terminals little has been done in this country. In Europe greater

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† Manager Eastern office Brown Hoisting Machinery Company, New York.

advances have been made, due largely to the encouragement given by the city or Government, which frequently itself equips the docks. At Hamburg, Antwerp, Bremerhaven, Glasgow, London, Manchester, Havre, and many other ports are found mechanical appliances, each to meet the local requirements, but all aiming to reduce the number and cost of handlings.

In England at the freight stations and warehouses the practice is to instal jib cranes, so arranged that they can serve all the floor space from car or wagon. In this country many of the railroads have put in hand cranes of the pillar or bridge type for handling freight from cars to wagons or vice versa, but they are mostly for heavy lifts, and are slow in operation and cover only a limited area.

Some of the railroads have put in electric cranes in their freight yards and water terminals; for example, the Pennsylvania Railroad Company on its Greenville docks, the New York Central & Hudson River Railroad Company at Port Morris, the Philadelphia & Reading Railroad Company at Port Richmond and the Central Railroad of New Jersey at Communipaw.

Package Freight at Terminals

Many of the railroads are coaling their locomotives at greatly reduced cost and time by mechanical appliances, but the question of handling their package freight at terminals is still open. Most managers have known that there is a great loss of time in transferring freight at terminal and intermediate points, but few seem to realize the high costs that this involves.

Perhaps the most complex movements in the handling of package freight are at the large steamship piers, due to the great carrying capacity of the large vessels, the many consignees, each having his allotted space, and the limited floor area that has to be cleared quickly to make room for the next vessel. The larger railroad terminals also have their many consignees, but the floor area is not so restricted.

The placing of the packages in the proper space is done by the hand truck. A sling load from the vessel or a railroad car may contain packages for several consignees. The track man cannot wait to sort as he receives them, so must load his truck with them as they come. This means a long travel to get the packages to their allotted space. In order to tier them, several more handlings are necessary. All this leads to congestion and increasing cost per ton. This is further affected by the rise in the cost of labor, materials, rent and larger terminals. Each terminal is a problem in itself, as is each manufacturing establishment, so that it is necessary to make a careful study of the conditions to be met before any mechanical method can be proposed.

In the last 30 years there has been a steady increase in the capital invested in manufacture, which means an increase of tonnage of all kinds of package freight carried by the steamship and railroad companies. To meet this, the railroads have increased their rolling stock and either enlarged their terminals or built more. In large cities this has been at great cost for land and buildings. The method of handling the freight has remained the same.

At a terminal there are two kinds of freight—outbound and inbound. The outbound is transferred from wagons into the outbound freight house, and thence to the railroad cars or directly from the wagons to the cars. The inbound is vice versa.

All the above movements, except between wagons and cars, involve the sorting of packages and distributing each to its designated space. It is also necessary to transfer cars from one freight house to the other, as the use of the hand truck necessitates bringing the cars to the freight.

Requirements in Freight Handling

A mechanical equipment to be satisfactory must be able to distribute the outbound and inbound freight simultaneously; there should be no rehandling, and every square foot of floor space should be served with a single handling. All motions of lifting and conveying should be done by power. The machinery should be designed to

give the greatest list required and to transfer to any reasonable distance and then tier or lower into cars. Continuous operation should be sought for to avoid delay.

No part of the transference should be along the floor, and the equipment should not take up any floor space that can be used for other purposes. All movements of the mechanical equipment should allow of the assorting and distributing according to classification and allotted space readily and quickly. There must be reserve capacity to prevent congestion in case of extra demands. The justification for the investment of the mechanical installation lies in the reduction of cost and the saving of time in handling. The expense should be in proportion to the size of the terminal.

There are many companies in this country engaged in the manufacture of hoisting and conveying machinery. While perhaps no one makes all the necessary appliances, yet a combination of their product could be used to fill the special requirements of each terminal point.

How to Meet the Problem

Fully to cover the floor space and obtain all the different requirements for the satisfactory handling of the package freight, three units or different types of conveying machinery are necessary. These are the single rail electric trolley, the bridge traveler and the cross traveler. The electric trolley is the actual load carrying part of the equipment, the single rail, bridge traveler and cross traveler furnishing a combination of loop track system on which the trolley can reach any part of the area to be covered. All movements should be so regulated that there will be no interference, and many trolleys can be in operation following one another. Each trolley can draw a number of trailer trolleys, so that many packages can be hoisted and transported under the control of one man. This arrangement allows many loads to be transported in close sequence simultaneously, and with maximum hoisting and traversing speeds, gives the greatest range and capacity at a minimum of labor and maintenance. At some freight terminals it may be necessary to have, in combination with the above mechanical conveyors, motor trucks on the surface; in others, belt conveyors.

There is no doubt that some such scheme as outlined above, when properly carried out to meet the special requirements at any terminal, would materially reduce the time and cost involved in the present method. This has already been exemplified in the handling of bulk material.

Considering the special attention now being given this question by several engineers and the interest shown by many steamship and railroad managers, it can be safely stated that within the next few years great changes and developments will be accomplished.

German Iron Ore Production in 1910

The statistics of iron ore production in Germany and Luxemburg in 1910 have been compiled, showing a total of 28,709,654 metric tons, equivalent to 28,249,000 gross tons, as against a previous high record of 27,252,000 gross tons made in 1907. The importations last year were the greatest on record, at 9,653,000 gross tons. The comparison with the preceding five years is as follows:

	Output of native iron ore.	Exports of native iron ore.	Imported for home consumption.	Total home consumption.
1905.....	23,067,000	3,640,000	5,987,000	25,414,000
1906.....	26,305,000	3,790,000	7,507,000	30,022,000
1907.....	27,252,000	3,841,000	8,340,000	31,751,000
1908.....	23,896,000	3,010,000	7,611,000	28,488,000
1909.....	25,104,000	2,781,000	8,235,000	30,558,000
1910.....	28,249,000	2,903,000	9,653,000	34,799,000

The Standard Bridge Tool Company, manufacturer of Thomas spacing tables and laying off machines for structural shops, and builder of special equipment, has moved its office from the Penn Building to the Bessemer Building, Pittsburgh, where it has secured larger quarters.

A Roll-Over Core Machine

The Midland Machine Company, Detroit, Mich., which for some time has manufactured the Grimes roll-over molding machine, has recently developed the Grimes jolt rammed roll-over core machine shown in the accompanying cuts, to take care of small molds and to introduce a

been jolted with the foot lever and clamped, ready to turn over. In Fig. 3 the table is raised and the flask is being turned, the center of gravity of the core being the center of rotation. Fig. 4 shows the core on the two receiving arms and the core box raised off from the core by pressing on the foot lever.

For long work the receiving arms are swung out of the way and the core box turned without raising the table. The machine has three bars rigidly fastened at top and bottom, which form the sliding guides. The top connection between these bars forms the bearing for the long trunnion for the revolving table. For small light work the clamp can be taken off and the plate held in place by hand, while rolling over the core. The cam and lever arrangement is counterweighted, adding to the ease of operating the machine. As part of the work of making a mold or core is performed by the foot, the machine is speedy, there being no lost time between the different operations. The machine is built in two sizes, with a rise of 10 in., which makes it possible to take care of a considerable variety of work, both as a molding machine and a core machine.

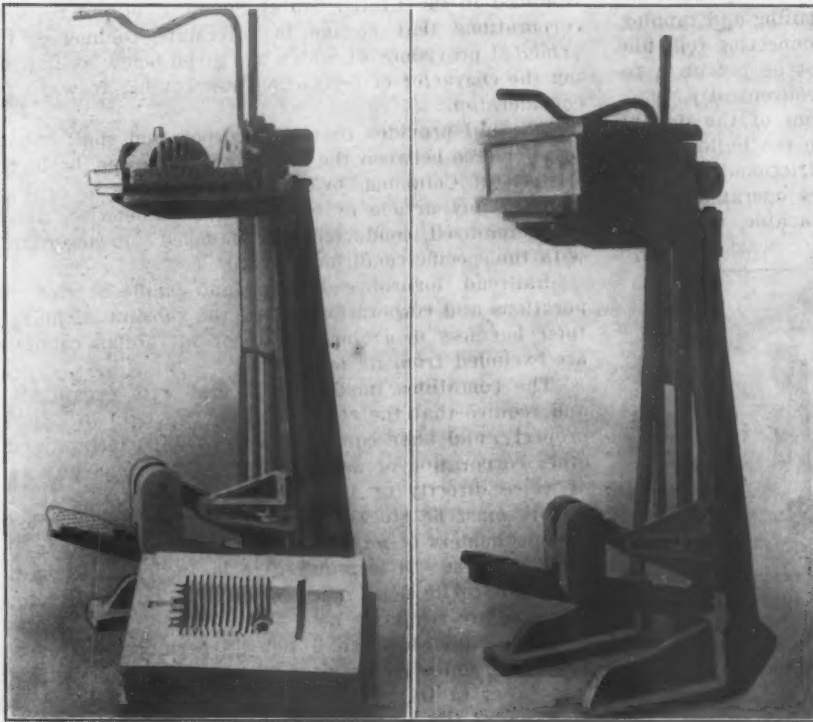


Fig. 1.—Core Machine with Pattern. Fig. 2.—Core Box Clamped Following Ramming.

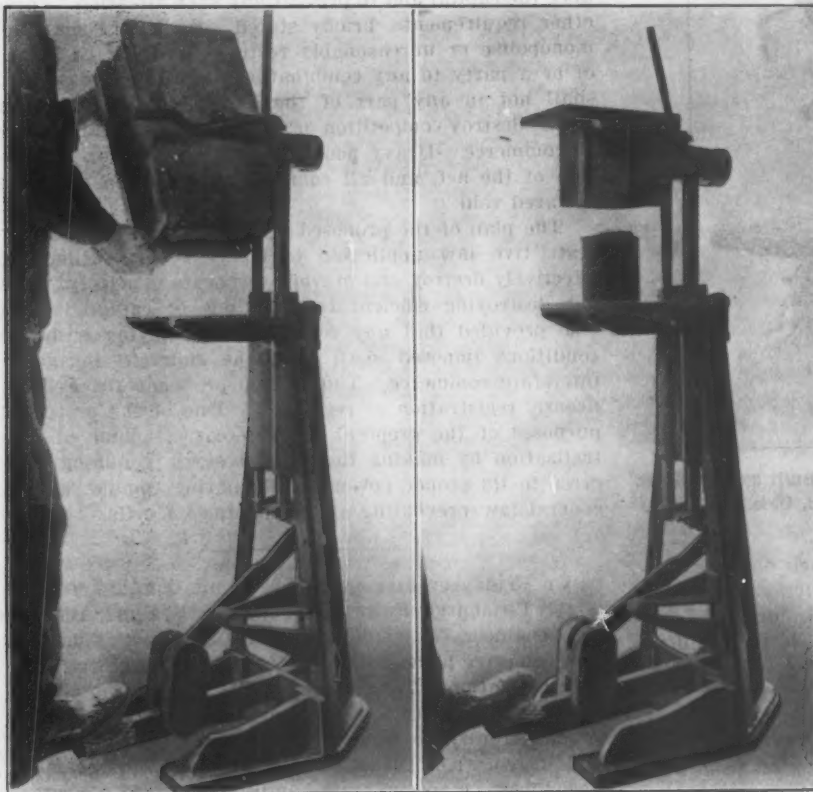


Fig. 3.—The Core Being Turned.

Fig. 4.—Core Box Drawn Off the Core.

new economy in the core room. Core making machines for round or square stock cores are well known, but there has been a demand for a machine especially designed for the regular and special cores of various shapes and sizes. Fig. 1 shows an air cooled cylinder mounted on a plate and fastened to the rotating table of the Grimes machine, with a completed mold at the side. The air-cooled cylinder was jolt rammed and drawn without wires to hold the ribs. In Fig. 2 the mold is shown after it has

lb. per square inch, and any tubes failing to stand this test will be rejected.

Peter A. Frasse & Co., distributors of Shelby seamless steel tubing, and sole American agents for Poldi superior tool steels, are now located at their new quarters, corner Sullivan and Canal streets New York, and very shortly will have their several departments in perfect order.

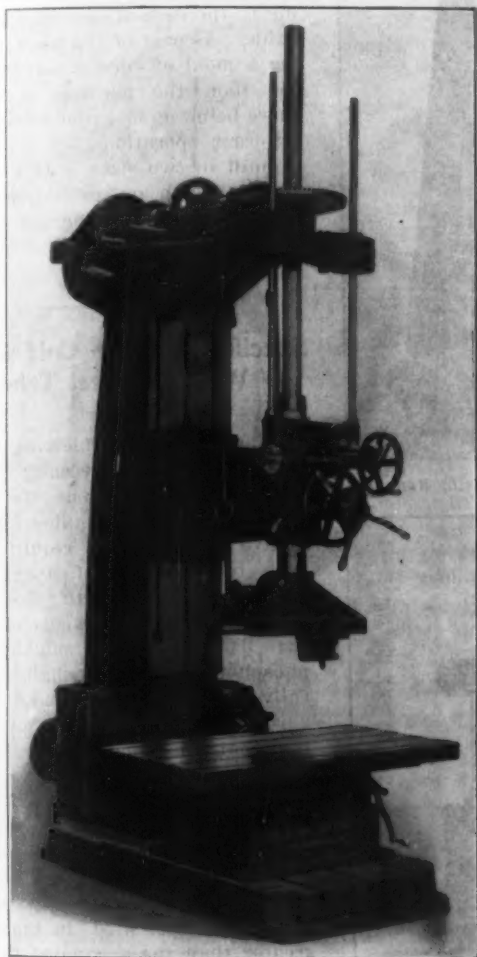
Specifications for Cold Drawn Weldless Steel Tubes

The British Engineering Standards Committee recently issued standard specifications for cold drawn weldless steel tubes for locomotive boilers. It is required that such tubes be manufactured from the best open hearth steel, and must not show on analysis more than 0.03 per cent. of sulphur or of phosphorus; that they shall be carefully annealed throughout their length after the operation of drawing; that when cold they must stand bulging without showing either crack or flaw until the diameter of the bulged end measures not less than 15 per cent. for tubes under 11 s. w. g. in thickness, and not less than 12½ per cent. for tubes 11 s. w. g. to 8 s. w. g. in thickness, greater than the original diameter; that a piece of tube 2 in. long shall be placed on end and must when cold stand hammering down, until it is reduced to 1½ in. high, without showing either crack or flaw; that the tubes must when cold stand flattening, without showing crack or flaw, until the interior surfaces of the tubes meet, or, when the tubes are over 11 s. w. g. in thickness, until the interior surfaces are brought to a distance apart equal to the thickness of the wall of the tube; and that every tube shall be tested by an internal hydraulic pressure of at least 1000

The New Drees Vertical Boring Machine

In all shops pieces have to be handled at times that cannot be accommodated on a revolving table boring machine. For this class of work the Drees Machine Tool Company, 227 West McMicken avenue, Cincinnati, Ohio, has developed a new type of vertical boring machine. This new tool is intended for heavy drilling and tapping, cutting holes in steel plates, bars or connecting rods and boring and facing pieces which cannot be put on a revolving table machine or boring mill conveniently.

The general design and arrangement of the driving mechanism is similar to that found in the builder's upright drills, but in addition it has a frictional stopping, starting and reversing device. This is operated by the bent handle on the left side of the machine, which can



The Latest Type of Vertical Boring Machine Built by the Drees Machine Tool Company, Cincinnati, Ohio.

be adjusted so as to be within easy reach of the operator at all times. The fork and the friction clutch arrangement are attached to a balanced horizontal bar and as a further precaution against the latter accidentally engaging itself, it is held in place with spring dowel pins. The operation of the back gears is controlled by steel clutches which are engaged and disengaged by the long vertical lever at the left of the column.

Two rods control the different kinds of feed with which the machine is equipped. For ordinary boring and drilling four fine feeds are made available by manipulating the left feed rod, while leads equal to the standard pipe threads are regulated by the right feed rod. A weight on the inside of the column balances the spindle and the spindle head. A facing head, operated by a star feed, is furnished for the nose of the spindle. The compound type of table is furnished, the traverse movement being 8 in. and the longitudinal one five times as great.

A 12-hp. polyphase constant speed motor is employed for driving the machine and the necessary speed changes are secured by a five-step cone pulley and the back gears.

The complete weight of the machine is approximately 12,000 lb.

Federal Regulation of Corporations Proposed

Senator John Sharp Williams of Mississippi has introduced in the United States Senate a bill to regulate corporations that engage in interstate commerce, the principal provisions of which are given below as indicating the character of legislation now coming forward for consideration.

The bill provides that "no corporation shall engage in commerce between the States or territories, or in the District of Columbia, by the purchase, sale or consignment of any article of commerce, or otherwise, unless it is organized, conducted and managed" in accordance with the specific conditions named.

Railroad, insurance, banking and public service corporations and corporations doing the substantial bulk of their business in a single State or in foreign countries are excluded from its operation.

The conditions imposed deal first with organization and require that the stock shall be full paid in cash or property, and have equal voting power, "except that no other corporation or association shall be given any vote or voice directly or indirectly in its affairs." Its directors must be stockholders and are not to be officers or stockholders of any other corporation engaged in the same business. It is required to be incorporated in the State where its head office is located and its directors' meetings are regularly held.

Its capital stock shall not be permitted to exceed \$5,000,000 unless authorized by a court upon satisfactory proof of its purpose, which shall not involve any violation of the other requirements of the act as to conduct and management, and with reserved power to reduce the capital and to prevent any such violation. These other requirements, briefly stated, are that it shall not monopolize or unreasonably restrain trade or be a part of or a party to any combination for such purpose, and shall not in any part of the United States by unfair means destroy competition or restrain trade in any article of commerce. Heavy penalties are imposed for a violation of the act, and all contracts in violation of it are declared void.

The plan of the proposed law is to provide a uniform restrictive law applicable to business corporations, to effectively destroy and prevent corporate monopoly, without destroying efficient combinations of capital. It is also provided that any corporation complying with the conditions imposed shall have the right to engage in interstate commerce. There is no provision for Federal license, registration or regulation. One of the professed purposes of the proposal is to defeat all plans of centralization by making them unnecessary, confining Congress to its proper powers of regulating commerce by a general law preventing and punishing its evils.

On Friday evening, April 28, at the monthly meeting of the Pittsburgh Railway Club, F. N. Speller, metallurgical engineer, National Tube Company, will read a paper on locomotive boiler tubes. In the afternoon of the same day the National Tube Company has invited the club to visit the Ellwood City plant where the members will have an opportunity to observe the manufacture of Shelby cold drawn steel tubes and Shelby hot rolled seamless steel tubes. A special train has been arranged for, which will leave the Pittsburgh & Lake Erie Depot at 12.30 p.m., arriving at Ellwood City at 1.40.

The Washington Tin Plate Company, Washington, Pa., is having the engineering firm of S. Diescher & Sons, Farmers' Bank Building, Pittsburgh, make estimates on extensions to its plant. The improvements will include the installation of four additional cold tin mills, two additional hot tin mills, six sheet and pair furnaces, two annealing furnaces and a 15-ton electric traveling crane having a 56-ft. span.

Die-Casting Machines

A Study of the Various Types Used

BY E. F. LAKE, BAYONNE, N. J.

The process of making castings in metal molds and having them within 0.0005 in. of the correct size and with a surface as smooth as if machined, has been kept a secret for many years. Essentially it consists of injecting molten metal with considerable pressure into a steel die, opening the die, ejecting the casting, closing the die and injecting more metal. The idea was probably suggested by the line of type that was automatically cast by the type setting machines or by the lead bullets that used to be cast in iron hand molds. The process has developed steadily from the bullet molds, and each individual that has been brought in contact with it has added improvements of one kind or another with the result that better castings are now being made than was possible in the early stages of the industry.

Sufficient pressure is applied to the metal to make it fill the steel mold completely and prevent shrinkage after it solidifies. In this way a surface as smooth as though finished with machine tools is obtained, and castings several inches in size will not vary more than 0.001 in. from the required dimension.

Casting Metals

Up to the present time castings have been made only from metals that form a white alloy, but the writer has the necessary data to build machines that will cast some types of brasses and bronzes and possibly other metals are even stronger. The white metal alloy that is now cast is quite brittle and not as strong as yellow or red

Zinc, tin, copper, lead, aluminum, antimony and bismuth have been used in various combinations to make an alloy that could be cast without blemishes and have the necessary strength, lead, tin, zinc and antimony being most commonly employed. Fahrig metal, composed of

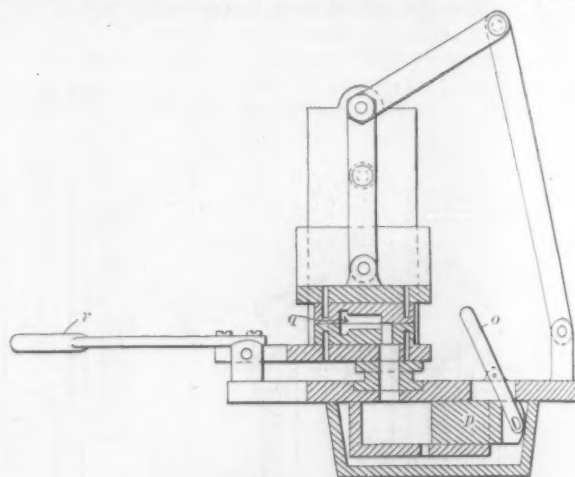


Fig. 2.—One of the Earlier Types of Die-Molded Casting Machines.

91 per cent. tin and 9 per cent. copper: Parsons white bronze, containing 65 per cent. tin, 29 per cent. zinc and 4½ per cent. copper, and pure Banca tin have also been cast successfully in the die-casting machines.

Many alloys were made and sent out in castings that would disintegrate enough to become worthless in two or three years. Many others were of such a combination, or were cast by such poor methods that holes would form in the center while the outer surfaces were as smooth as a piece of machined steel. These faults have only been overcome by a large amount of experimenting and practical experience. The more reliable die-casting firms are now sending out castings where the metal is solid all the way through and possess considerable strength. The metal, however, has not yet been made as strong as ordinary brass and the best casting shops are apt to ship a batch of castings with porous centers and smooth outer surfaces before they could detect them.

There are several conditions that must be right before castings that are sound and strong can be cast exactly to size in steel molds. First, the machine that contains the melting pot and injects the molten metal into the mold must be correct in design and easily operated; second, the metal alloy that is to be cast must be of the right composition; third, the temperature of the casting metal and the die-mold must be at the proper degree; fourth, the die-mold must be smooth on the inside, true to size and parted and vented properly; fifth, the shrinkage must be controlled or allowed for or both, and sixth, the time allowed for making each casting and removing it from the mold must be correct. The third and the sixth conditions are controlled by the operator of the machine; the metallurgist should decide the second entirely and the fifth partially, while the tool or die-maker should meet the fourth condition and aid the metallurgist in solving the fifth. This leaves only the first condition to be taken care of. As the whole process is based on this, the machine is therefore the most important factor.

A Modern Machine

One of the latest machines designed for rapidly casting the white metal alloys in steel molds is shown in Fig. 1. In this type a resistance coil, *a*, surrounds the crucible *b*, in which the metal is melted. The electric cur-

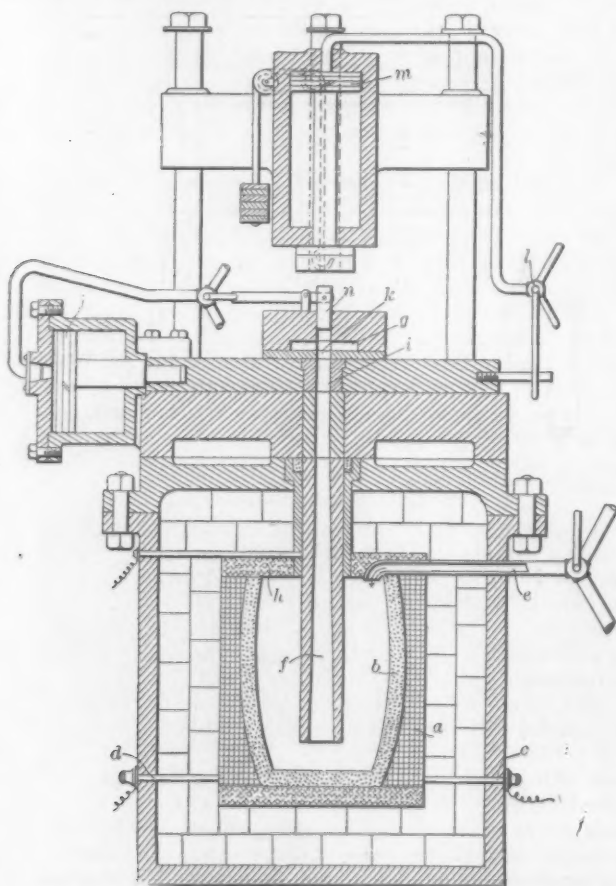


Fig. 1.—A Modern Pneumatic Die-Casting Machine in Which the Metal Is Kept Melted by Electricity.

brass. It must melt at a temperature low enough not to destroy the steel mold, which means that most die-molded castings are made from alloys that melt at temperatures between 500 and 800 deg. F.

rent enters and leaves the coil at *c* and *d*. Compressed air is injected into the melting chamber at *e*, which is made tight by the slab *h* and forces the molten metal up through the tube *f* into the steel die-mold *g*. When the mold is filled with molten metal the slide valve *i* is pushed over by the air piston *j* until it closes the hole *k* in the mold. The compressed air is then turned on at the valve *l*, and the piston *m* forces the plunger *n* down in the mold until the metal completely fills the mold and becomes solid.

The operation of the pistons and the other moving parts can be controlled automatically, which leaves very little hand work for the operator. The opening of the mold, ejecting the casting and closing the mold to receive the next casting, can also be done automatically, so that all the operator would have to do then would be to see that the crucible was kept filled with metal.

Many attempts have been made in the past to force compressed air over the top of the metal bath to get the metal into the mold. This was done because in the original

to allow the air pressure machine to become a commercial success.

One of the earliest types of die-molded casting machines is shown in Fig. 2. When the lever *o* was pushed backward it moved the plunger *p*, and this forced the metal under pressure into the mold *q*. The lever *r* was then pulled over to cut off the metal so the casting would have no gate, or show imperfections where it had been located. The casting was then removed from the mold, and the machine made ready for the next casting.

Quick Acting Upright Machines

In Fig. 3 is shown one of the later types of upright, hand operated, plunger die-casting machines. It was designed specially for speed in opening and closing the mold.

As in the simpler machine illustrated in Fig. 2, the metal is kept molten in the cylinder *g* by gas flames that surround it in the chamber *h*. The plunger *i* is forced in by the lever *j* to squeeze the molten metal into the mold

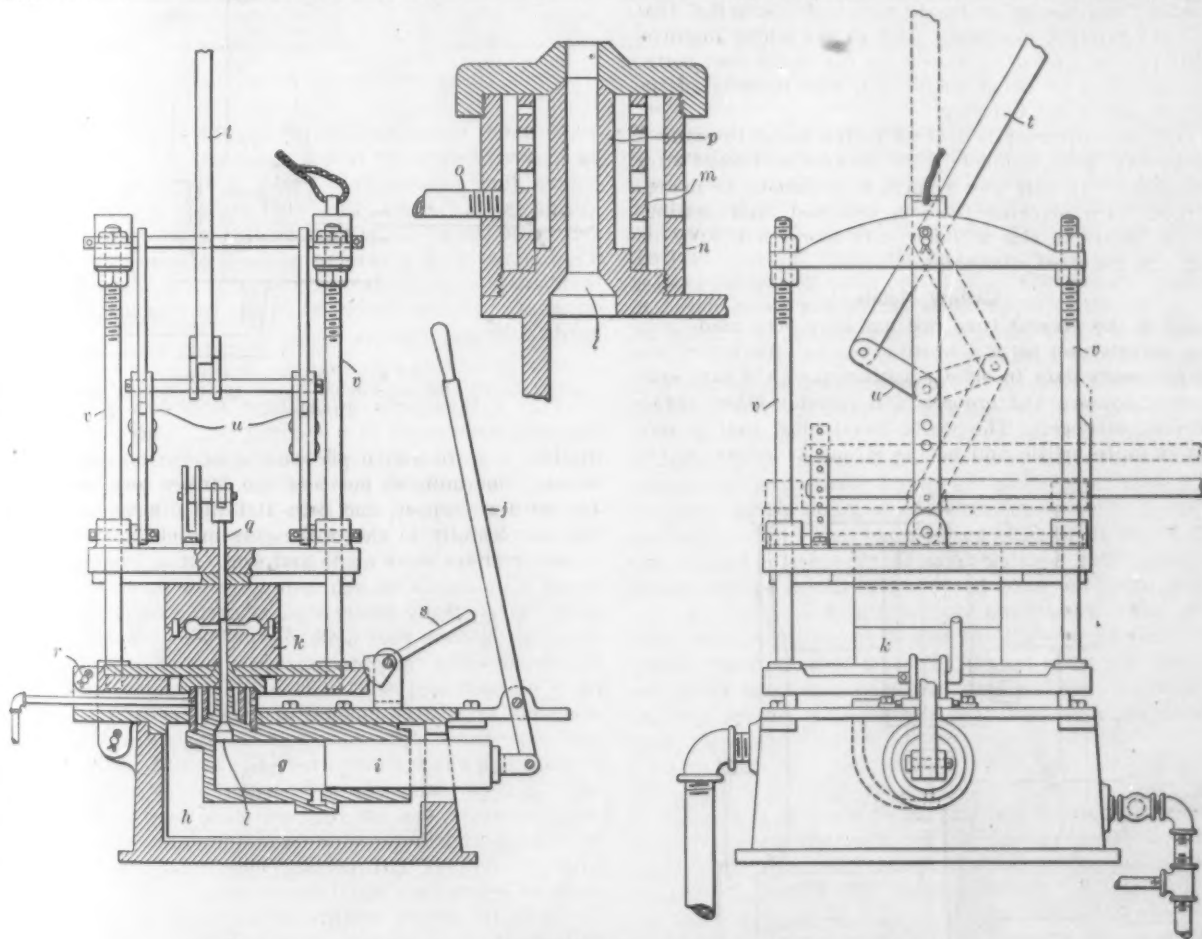


Fig. 3.—An Upright Hand-Operated Plunger Machine.

type of cylinder and plunger machine the plunger would stick owing to a thin film of casting metal getting around the bearing surface of the plunger and freezing with the result that the plungers had frequently to be removed for cleaning and often had to be replaced with new ones. As the plunger was located in the melting pot, which was placed inside the furnace chamber with the die-mold over it, the machine practically had to be taken apart to remove and to replace the plunger.

Compressed air was such a simple thing to use and, to the uninitiated, it seemed so impossible to make it enter the metal that it was hailed as the remedy for plunger troubles. The metallurgist had no part in this, as he knew that molten metals are covered with fluxes which many times take the form of heavy slags to prevent the air from attacking the surface of the metal. This is because the oxygen and nitrogen of the air—especially the oxygen—have such a great affinity for molten metals. Even though compressed air, for forcing the metal into the mold, has been tried by many different firms, it has, in time, always been abandoned. This was due to the fact that the percentage of poor castings was too great

k through the nozzle *l*. Around the discharge passage *l* is located a heating chamber, an enlarged sectional view of which is shown in the upper part of the drawing between the two main views of the machine. This chamber is formed by two rings, *m* and *n*. Gases are sent through the pipe *o* and are burned in the spaces between the discharge nozzle lining *p* and the rings *m* and *n*.

This chamber was designed to obviate one of the greatest troubles with die-molded casting machines. The passage between the mass of molten metal and the die-mold must of necessity be so small that the metal is apt to stay there long enough to become solid and clog up the passage. If the metal did not remain there long enough to freeze, small portions would be left after each casting was made, and these would accumulate until the passage was filled. This would cause the machine to be stopped and kept idle long enough to clean out the passage. Hence something had to be devised to prevent the clogging, and the above mechanism is one of the designs that have proved successful.

When the mold has been squeezed full of molten metal the rod *q* is forced down by a lever. It traps the metal

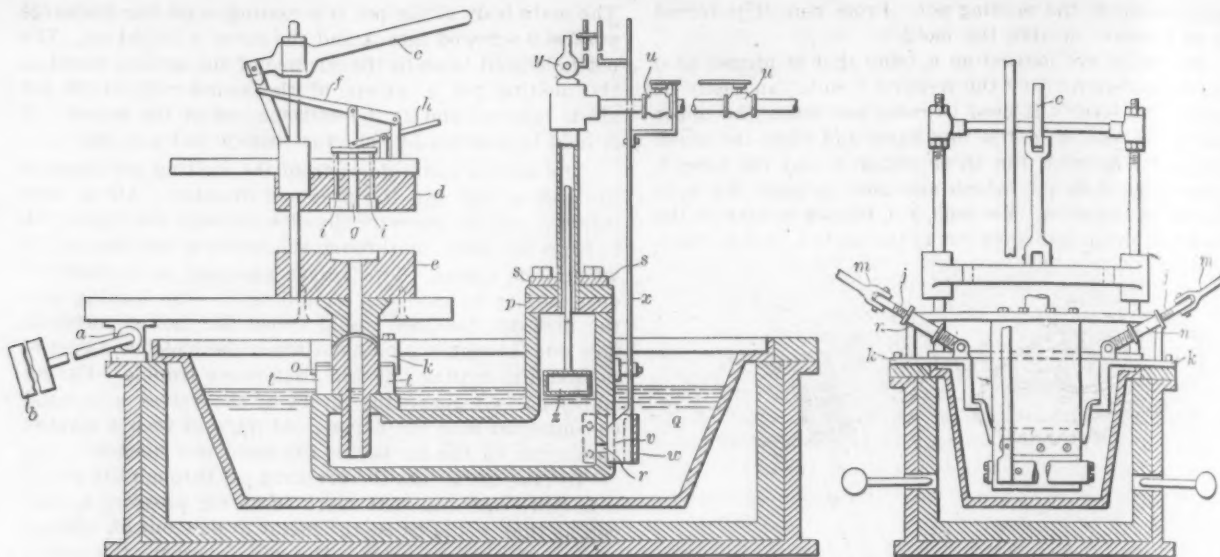


Fig. 4.—A Machine Operated by Air Pressure with a Tilting Table for the Molds.

in the mold until it solidifies, and cuts off the balance of the molten metal so it will drop back into the cylinder *g*. This has been designated a sprue cutter, and where there is a hole in the center of the casting this is, without doubt, the best form of sprue cutter. The rod can be made to the exact size and shape of the hole desired, and the casting will mold to the rod. Where the casting has no center hole the sprue cutter has to be placed in other parts of the mold, in other positions, or take an entirely different form.

To set the die-mold in the correct position for molding, the upper part of the machine is tipped back on the hinge *r*. When set, it is again placed in the upright position and locked by the eccentric that is moved by the lever *s*. To remove the casting, the lever *t* is swung to the upright position. This operates the toggle joints *u* that raise the upper half of the mold on its guide rods *v*, of which there are four. The position taken by the lever and the toggle joints when the mold is opened is shown by the dotted lines in the right hand view of Fig. 3.

Fastening one-half of the die-mold on a plate and moving this plate up and down on rods by toggle joints is a means that has been employed to a large extent on die-casting machines. As the metal is forced into the

mold under considerable pressure, the two halves of the mold are likely to be forced apart and open at the joint unless they are securely held. A toggle joint of this design is simple and when well fitted will hold the two halves of the mold together against much more pressure than is met with in present methods of die-casting. It is well adapted to hand operated machines, but other devices are probably better when the casting machines are made more automatic.

An Air Pressure Machine

Fig. 4 illustrates a machine that has a pressure chamber submerged in a melting pot. The view at the right is a section through one end of the machine, with the air line and the valve bridge broken away to show the arrangement of the gate and the die-mold also removed. The metal enters the pressure chamber through a port near its bottom and thus keeps on a level with the

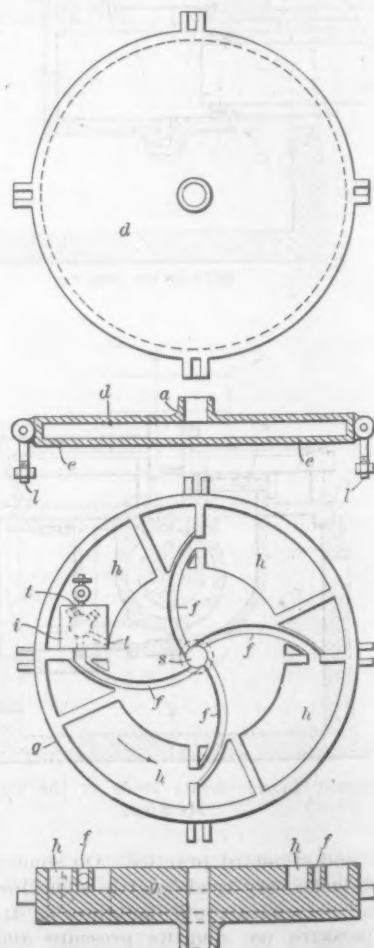
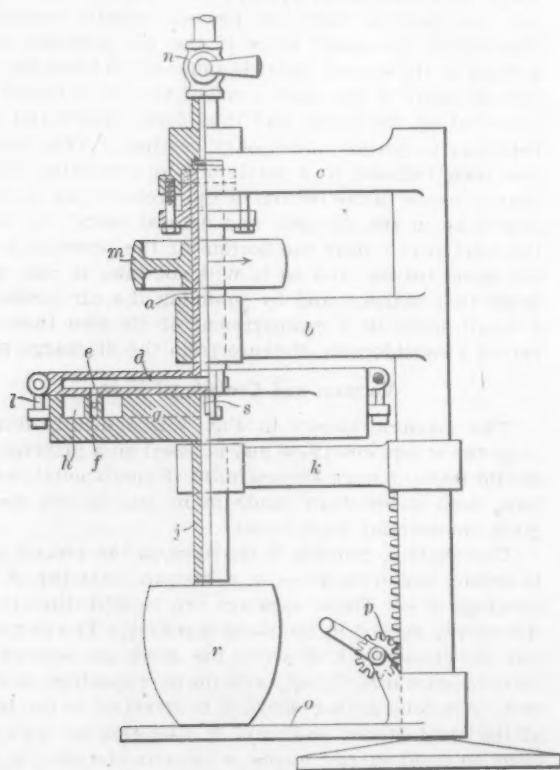


Fig. 5.—A New Machine Utilizing the Principles of Vacuum and Centrifugal Force.

molten metal in the melting pot. From here it is forced by air pressure up into the mold.

The molds are located on a table that is hinged at *a* and counterbalanced by the weights *b* so it can easily be tilted. The lever *c* is used to raise and lower the upper half of the mold *d e* and thus open and close the mold. The lever *f* operates the sprue cutter *g*, and the lever *h* operates the rods *i i*, which are used to push the castings out of the mold. The rods, *j j*, hinged to lugs on the bracket *k*, swing into slots cut in the plate *l*, and by turn-

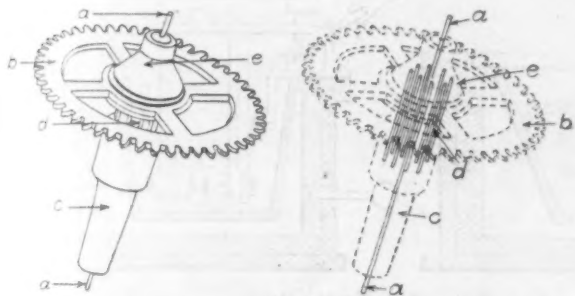


Fig. 6.—One of the Best Examples of Work Done with Die-Casting Machines.

ing down the levers *m m*, the eccentrics on their ends clamp the mold halves and their entire mechanism to the chamber containing the molten metal, and from which it is forced up into the mold. The turn-buckles *n n* are used to adjust the eccentrics to the proper length for clamping tightly.

In the mechanism that holds and operates the mold this machine is very similar to other die-casting machines. The principles adopted here have become almost the

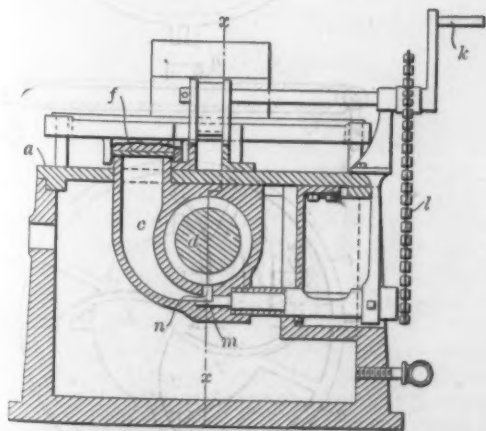
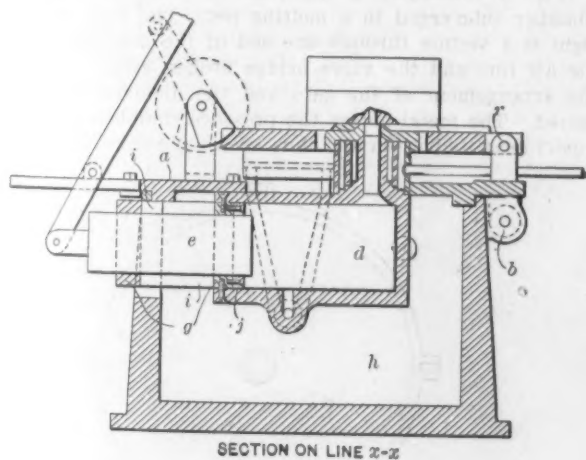


Fig. 7.—Recent Improvements Made in the Plunger Type of Machine.

universal and standard practice. On some machines the apparatus looks very crude and in some instances better mechanical principles could doubtless be applied.

The pressure pot and its pressure and intake mechanism are very different from those of other machines.

The main body of the pot is a casting, with the discharge nozzles *o* screwed into it and the cover *p* bolted on. The pot is located beneath the surface of the molten metal in the melting pot *q*, except at the round end where the air is injected and at the extreme end of the nozzle. It is held in position by the cross bars *s* and the lugs *t*.

The molten metal flows from the melting pot through the port *r* and into the pressure chamber. Air is then injected into the pressure chamber through the valves *u u* to force the metal up through the nozzle *o* into the mold *e* when it is closed. Two valves are used as a check on one another in case one should leak. Air leaking into the pressure chamber would cause the molten metal to flow out through the nozzle *o* when the mold was opened to take the casting out and thus cause trouble. For an additional safeguard the levers of the valves *u u* could be connected with the upper mold plate in such a manner as to turn off the air before the mold was opened.

To take metal into the pressure pot through the port *r* it is quite essential that there be no air pressure in this pot, as that would cause the metal to flow out of, instead of into, the pressure pot. The slide *v* covers the port *r* and is held in place by the plate *w*. To this slide is attached the rod *x*, and this in turn is attached to the lever of the pet cock *y*. Thus when the slide *v* uncovers the port *r*, the pet cock *y* is opened to let out any air pressure that might be in the pressure chamber. This method of opening and closing the intake port is the only practical and successful one that can be used when it is to operate underneath the surface of molten metal. An ordinary valve and valve seat soon accumulate oxide and dross, and these lodging on the seat make the valve fit poorly and cause a leakage of air. This leakage reduces the air pressure in the pressure chamber, and hence the metal will not enter the mold with force enough to completely fill all parts.

To prevent the air from striking the surface of the metal forcefully, a float is located at *x*. A rod is fastened to the upper side of the float and moves up and down in a tube to hold the float in position and prevent it from wedging or jamming and thus becoming fastened to the walls of the pressure chamber. If the air were allowed to strike the molten metal with its full force it would cause the latter to splash and the flying particles would lodge on the air inlet and freeze and eventually close the opening.

In this machine the designer has reduced the troubles inherent in the air pressure machine to a minimum. These troubles, however, have not been entirely removed nor can they be when air presses directly against the surface of the metal since if the air pressure on the surface of the molten metal is sufficient to force the metal into all parts of the mold, some of the air is bound to be absorbed by the metal and thus form oxides and dross, resulting in porous and spongy castings. This tendency has been reduced to a minimum by extending the discharge nozzle to the bottom of the pressure pot so it will only take in the cleanest and densest metal, by placing the inlet port *r* near the bottom of the pressure pot for the same reason and so it will not take in any of the dross that gathers and by confining the air pressure to a small space in a compartment of its own that is removed a considerable distance from the discharge nozzle.

Vacuum and Centrifugal Force

The machine shown in Fig. 5 is radically different from the others described and is based on a principle that should make it work successfully. Experimental castings have been successfully made in it, and it will soon be given commercial work to do.

The shaft *a*, running in bearings on the arms *b* and *c*, is hollow and terminates in a vacuum chamber, *d*, with openings at *e*. These openings are located directly over the curved ports *f* in the mold carrier *g*. The ports open into the chambers *h* in which the molds are located with their in-gates directly opposite the port openings, as shown at *i*. A second hollow shaft, *j*, is attached to the bottom of the mold carrier and runs in a bearing on the arm *k*. Lugs on mold carrier enable a vacuum chamber, *d*, to be bolted to it with pivotal bolts *l*.

To operate the machine the vacuum chamber and the

mold carrier are revolved by a belt running on the pulley *m* in the direction shown by the arrow. The valve *n* is then opened and an air pump sucks the air out of the shaft *a*, the vacuum chamber *d*, the curved ports *f* and the molds *i*. The table *o* is next raised up by the pinion and the rack *p* until the hollow shaft *j* is near the bottom of the crucible *r*. The partial vacuum in the upper part of the machine causes the metal to rise out of the crucible through the opening *s*, and the centrifugal force of the mold carrier aided by the vacuum causes the metal to flow through the ports *f* into the molds *i*, the vents *t*, helping the metal to fill all the corners of the mold. When the castings are completed the bolts *l* are unhooked, and the mold carrier *g* is swung on the arm *k* out from under the vacuum chamber *d*, so that the castings may be removed. Four pockets for molds are provided in this carrier, but this number may be made more or less according to the size of castings made.

With this type of machine the plunger is done away with and hence all the troubles connected with it. The melting pot with a submerged pressure chamber is also eliminated. There it is very difficult to keep the metal hot enough in the pressure chamber without making it too hot in the melting pot. While air is used in this machine, it is drawn away from the metal to create a vacuum and not compressed and forced down upon its surface. This air is used in the proper way, and no injurious effects should be seen in the metal.

If the vacuum and the centrifugal force can be controlled, so as to fill the molds completely before the metal chills and not clog up the machine, this should be one of the best methods established for making die-molded castings. With it an ordinary oil or gas heated melting furnace or a crucible may be used to melt the metal and the machine attached in a manner to draw the metal out.

It may be, however, that these two forces cannot be controlled properly, and it may be that it would not make castings fast enough to make it a commercial proposition, but if such were the case it would be easy to obtain a dense, clean metal in the castings and perhaps metals of a higher fusion point could be cast.

The above machines illustrate the fundamental principles that have made the casting of low fusion alloys a commercial success. The making of castings to accurate measurements from metals or alloys of a much higher melting temperature is the next step in the evolution of the industry and is bound to revolutionize some parts of the foundry business.

Casting machines are in use that are belt driven and automatic and semi-automatic. One machine is entirely automatic and is working daily in a Western clock factory. It makes the wheel, the pinion, the staff and the pivots in one piece, as shown in Fig. 6, by casting a white metal alloy around them. First the wire forming the pivots *a a* and the rounds of the pinion at *d* are unwound from a reel, straightened and pushed through accurately fitting holes in the die-mold. These holes locate the wires absolutely in the correct position, and the staff at *c* is cast around them. After this the mold opens and a perforated zinc disk is dropped over the pinion wires to hold them in position and act as a stop to the next half of the casting. A brass wheel, *b*, which has been previously formed with a hexagonal center large enough to clear the steel pinion wires *d* is next dropped into the mold, which is then closed. After this the part of the staff at *e* is cast and the casting thrown out of the machine. This is all done automatically and all the attendant has to do is keep the machine supplied with zinc disks, brass wheels and a reel of wire.

This method of inserting steel pieces, or those made of brass and bronze, in the molds, and then casting metal around them is carried on quite extensively; in fact, the re-inforcement of die-molded castings is common practice among the firms making this kind of castings, due to the inherent weakness of die-cast metals. None, however, have carried the automatic machine to the high state of perfection that this clock company has.

The wire used for the trundles *d*, in this lantern pinion, is 0.021 in. in diameter, and the holes through which it passes into the die-mold must be accurately spaced and of the correct size. If too small the wire will jam and

stop the machine, and if too large the metal will squeeze out around the wire and spoil the casting. Thus the holes act as a gauge for the wire, which, being held as it is, insures a correctness of size and shape in the piece, and a uniformity between the various pieces cast that could not be obtained in any other way.

Improvements in the Plunger Machine

In Fig. 7 is illustrated some improvements on the former types of plunger machines. The plate that holds the lower half of the die-mold and is hinged at *r* is the same as that shown on the machine in Fig. 3, as is also the furnace *h* and the specially heated discharge passage. Like the older machine the plate *a* is hinged at *b* and to its under side is fastened the melting pot *c*, the casting cylinder *d* and the plunger *e*. These are suspended in the furnace chamber *h* and surrounded by gas flames. A charging spout leads up through the plate *a* from the melting pot *c*. The cover to this spout is shown at *f*, and it is only necessary to remove this when new metal is added. The metal is usually melted in auxiliary furnaces and poured into the casting machines.

This machine differs from that illustrated in Fig. 3 in the diameter of the cylinder and plunger and the method of getting the molten metal into the cylinder. The plunger *e* is made considerably smaller in diameter than the cylinder *d* and slides in a sleeve, composed of the two collars *g*, held together by eight ribs like the two shown at *i i*. This is made of nickel steel and is machined outside and inside. To prevent the cylinder from leaking around the plunger, an asbestos washer, *j*, is placed next to the collar *g* on the inside of the cylinder *d*.

As the plunger is so much smaller in diameter than the cylinder, they do not touch at any point, and there is no danger of the two brazing or soldering together. In the ordinary design of plunger and cylinder, as shown in Figs. 2 and 3, the molten metal would squeeze in between them, harden and thus stick them together. Dross would also gather around the plunger and make it work hard. This is another source of trouble in the die-casting process and often meant that the machine had to be taken apart, the metal taken out, the plunger removed, the plunger and cylinder cleaned of the casting metal and the whole re-assembled. Many different ways have been tried to overcome this.

While this design greatly reduces the dangers of the plunger becoming stuck by the casting metal, special arrangements have to be made to get the molten metal into the cylinder. A better plan might be to draw the plunger out far enough for the inner end to rest on ribs and thus allow the molten metal in the melting pot *c* to flow around the ribs and into the end of the cylinder *d*. When the plunger was forced in, it would trap the metal that flowed into the cylinder *d* and force it into the mold.

The eccentric which locks down the mold plate that is hinged at *r* is thrown in and out by the crank *k*. This also turns a sprocket wheel around which runs a sprocket chain that turns another sprocket wheel at *l* at the bottom of machine. This in turn moves the rod *m*, one-half of which is cut away at the inner end, and thus opens and closes the port *n*. Through this port the metal flows from the melting pot *c* to the cylinder *d*.

After the plunger has been pulled back and while the mold is being opened to remove the casting and closed again, the rod *m* may be turned to the position shown in the lower portion of Fig. 7. Then metal flows into the cylinder *d* from the melting pot *c* to replace that which has been used in making the former casting. When the crank *k* is turned to clamp the mold into position for making another casting, the sprocket wheels and chain turn the rod *m* and close the port *n*. After this the plunger *e* is moved forward to force the metal up into the mold for making this other casting. This form of valve could be used to keep the casting metal in the melting pot until ready to use. The temperature could also be higher than if the metal were allowed to flow into the cylinder freely as in the ordinary casting machine. In this way metals of a higher melting temperature can be die-cast, providing the melting pot, the cylinder, the plunger and the molds can be made of a metal that will stand the higher temperature.

The use of automatic, semi-automatic or hand operated machines depends largely on the number of castings that are to be made. As die-casting machines are always built by the users they can be made in either style that is the more economical. Any number of die-molds may be used on one machine, as these can be fitted in such a manner as to be easily and quickly interchangeable. The making of the machines automatic or otherwise is purely a mechanical proposition and nearly any machine shop is able to design and build this part of the machine according to order.

A Special Bridge for Ladle Cars

An interesting bridge was recently built under the supervision of Frank C. Roberts & Co., Philadelphia, Pa., for the Upper Merion & Plymouth Railroad Company. The structure, which is to be used primarily for the transfer of hot metal from the blast furnace plant of Richard Heckscher & Sons Company, Swedeland, Pa., to the steel works of the Alan Wood Iron & Steel Company, Ivy Rock, Pa., is 881 ft. 7 in. long. It spans the Schuylkill River at the height of 43 ft. above low water and also crosses the tracks of the Philadelphia & Reading Railroad on both sides of the river and those of the Pennsylvania Railroad on the far side.

Although primarily designed for the use of ladle cars, the bridge can also be used for general purposes. The construction is very heavy, and the bridge is designed for a locomotive followed by a continuous train of hot metal ladle cars, spaced 20 ft. on centers and weighing 100,000 pounds each, including the contents. Plate girder construction is employed throughout with concrete piers to support the spans, which are of the deck type over the river and of the half through pattern where the railroad tracks pass underneath, as this style gives the necessary clearance.

The steel trough floor system is used and the steel is covered with concrete. On top of this concrete is a layer of waterproofing felt covered by a brick pavement laid in cement, on top of which is placed the stone ballast



The Bridge Over the Schuylkill River Connecting the Blast Furnaces of Richard Heckscher & Sons Company with the Steel Works of the Alan Wood Iron & Steel Company.

carrying the steel ties. The inside surfaces of the half through girders are covered with brick and concrete to protect them from injury by the hot metal. One of the special features of the structure is inwardly sloping splash plates, which are placed on the tops of these girders to prevent the hot metal from falling to the railroad tracks and similar plates extend the entire length of the deck spans at the top of the sidewalk guards to protect the steel sidewalks located on each side of the bridge. A very complete drainage system is also provided for the road bed.

The Cambria Steel Company, Johnstown, Pa., last week placed in operation its new wire mills, which have a capacity of about 300 tons daily.

The Sure Center Finder

A new tool for locating the centers of pieces held in a lathe chuck has been developed by W. A. Peck, 141

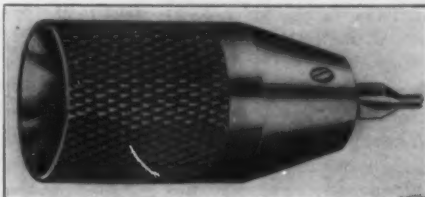


Fig. 1.—The Sure Center Finder for Lathe Work Made by W. A. Peck, New Haven, Conn.

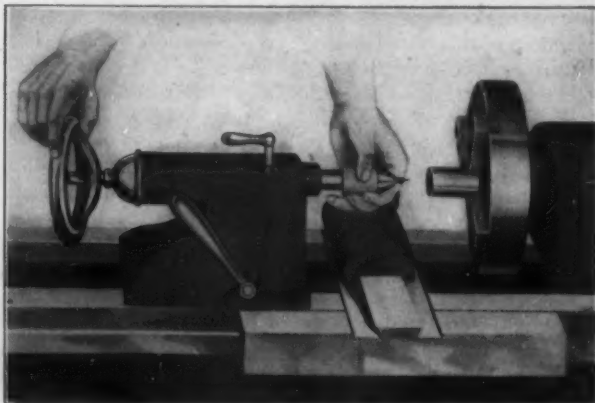


Fig. 2.—The Tool in Use.

Brewery street, New Haven, Conn. A view of the tool is given in Fig. 1, while its use in a lathe is shown in Fig. 2.

The finder has a socket which is tapered at an angle of 60 degrees to fit on the tailstock center of the lathe. When held in the position shown in Fig. 2 and fed up to the work, the tool immediately locates the center and the

friction between it and the lathe center is sufficient to hold it in position for drilling and countersinking. Each tool is fitted with a combination drill and countersink of one of the standard sizes.

Four sizes of finder are made and the following table gives the principal dimensions:

	No. 0.	No. 1.	No. 2.	No. 3.
Outside diameter, inches.....	1	1	1 1/4	1 3/4
Diameter of drill, inches.....	1/8	5/16	3/8	7/16
Diameter of body of combination drill and countersink, inches....	5/16	3/8	7/16	1/2

The two smaller sizes are supplied with a short length single end drill and countersink which is about half the length of the double end ones on the market, but for the sake of compactness the double end ones may also be used. The other two sizes are furnished with the regular double end combination drill and countersink.

Transmission Rope Splicing

The Practice Recommended by the Dodge Mfg. Company

To secure a splice which will be best suited for the American system of rope driving, the Dodge Mfg. Com-

pany equal to 60 diameters, or in this case approximately 7 ft., laid off and the rope securely tied with a piece of twine at that point. The strands at each end are then unlaidd back to this twine tie, as shown at A, Fig. 1. The next step which is illustrated at B is to cut the core close to the end of the solid rope, place the core ends together and join the corresponding strands in pairs. One strand of a pair is next unlaidd and laid in the other

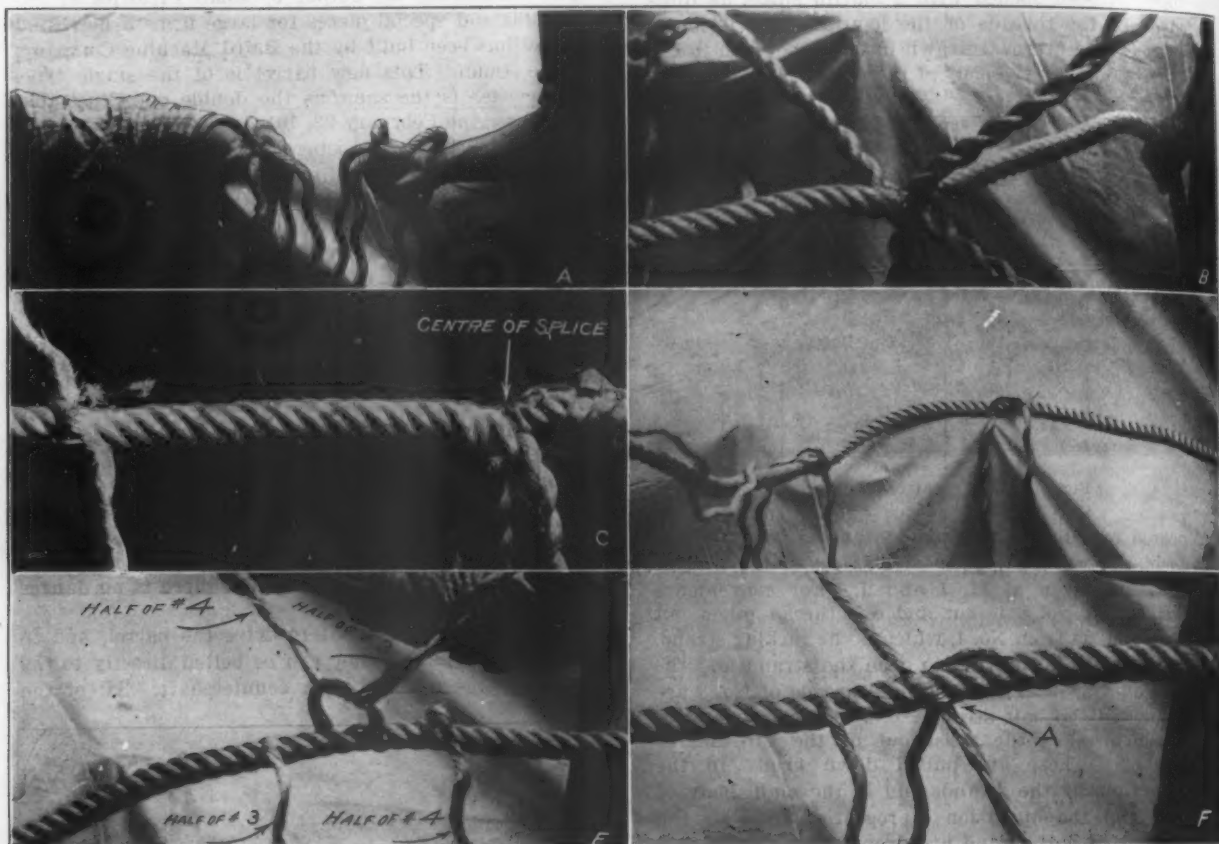


Fig. 1.—The First Set of Operations.

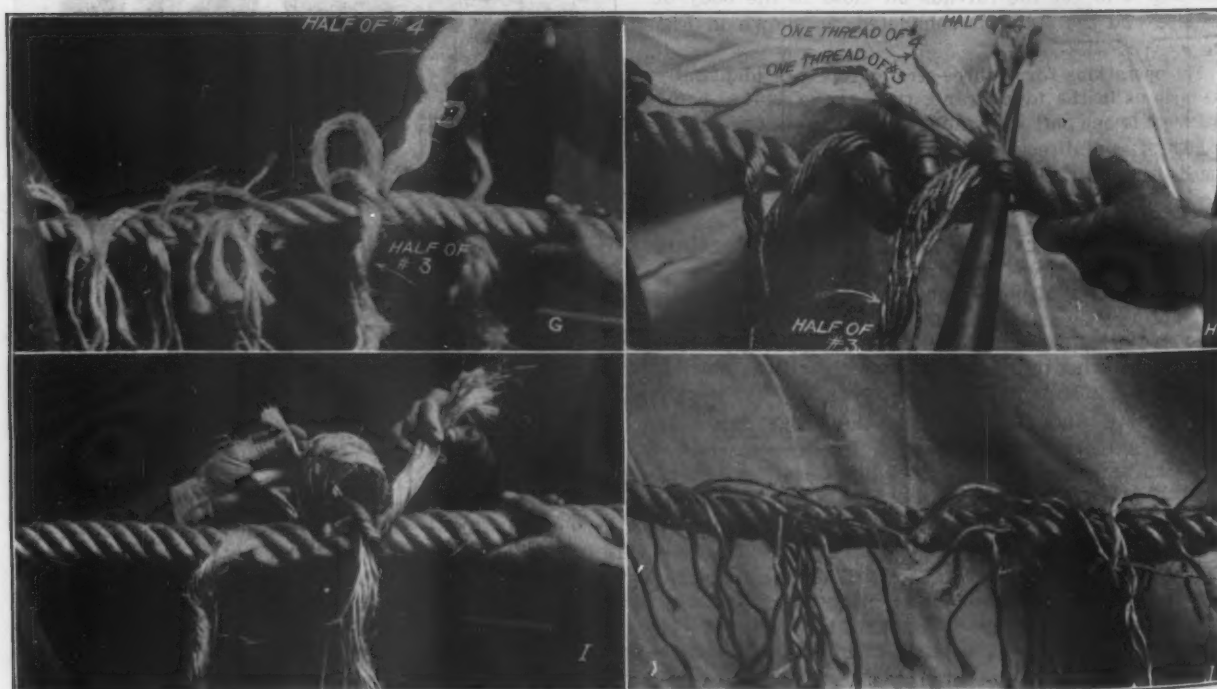


Fig. 2.—The Second Set of Operations.

pany, Mishawaka, Ind., has conducted a number of interesting experiments. As a result of these tests a long splice has been decided on. The successive operations in making this splice are all illustrated, each separate engraving showing one step in splicing a 1½-in. four-strand rope.

The rope is first tied and unraveled, a distance

until only enough of an end is left for tucking. This is then done with another pair, as shown at C. The two remaining pairs of strands are treated in the same manner until the three spaces between the strands are the same. This is clearly shown at D. Each pair is now unlaidd for two full turns back from the point of meeting, and two of the half strands are dropped below the rope,

as illustrated at E. The remaining halves are laid forward to the center of the space between the two dropped half strands and tied in a knot. Care should be taken in doing this to have the strands run the same direction in the knot as they do in the rope. This is clearly shown at the point A in F, Fig. 1, after the tie is made.

The two remaining half strands are taken and laid one around the other, as illustrated at G, Fig. 2. After the rope has been opened with a marlin spike, as illustrated at H, the threads of the loop are untwisted, as shown at G, and are next drawn in until they run in the same direction as in the body of the rope. This operation



Fig. 3.—The Completed Splice.

is repeated for all the half strands at the points where they meet. Views of the successive stages of the tucking operation are given at H, I and J. For convenience the half strand No. 3 is cut and one thread taken out from it as well as from No. 4, which is the tucking strand. The marlin spike is inserted to open the strand and the rope held as shown. The remaining threads of No. 3 are pulled out and the half strand No. 4 is drawn over and under, which takes the twist out of the threads, as shown at I. These are pulled down firmly in the same direction as the strands run in the main body of the rope, and the operation is repeated until all the threads of each half strand are dropped. The rope will then look like the specimen illustrated at J. The final step is to cut the threads off close to the body of the rope, and the splice is completed, as shown in Fig. 3.

The operations for a three-strand rope are identically the same as in the four-strand, the only exception being that there is one pair of strands less and only one pair is laid out of each direction, a tucking end and one pair of strands being left, the latter in the center.

The Mechanical Engineers' Pittsburgh Meeting

The Local Committee of the American Society of Mechanical Engineers, E. M. Herr, chairman; Elmer K. Hiles, secretary, having in charge the preparations for the spring meeting of the society, which will be held in Pittsburgh, Pa., May 30 to June 2, inclusive, has nearly completed the work of arranging the programme. It has been settled that the arriving guests will be received and registered at the Hotel Schenley, the society headquarters, on Tuesday morning, May 30. In the evening there will be an informal reception for the members and ladies in the parlors of the hotel. Professional sessions will be held in the Lecture Hall of the Carnegie Institute, near the headquarters, Wednesday morning and evening, Thursday and Friday morning. In the meantime there will be a number of inspection trips to various industrial plants in the vicinity, a boat excursion for the members and ladies up the Monongahela River, a reception and ball at the Hotel Schenley on Thursday evening and, finally, on Friday evening a smoker and entertainment, given by the Engineers' Society of Western Pennsylvania, in its rooms in the Oliver Building. The number of inquiries already received from expected guests indicates a very large attendance.

The Ridgetown Fuel Supply Company of Canada has been organized by Lima, Ohio, capitalists and others

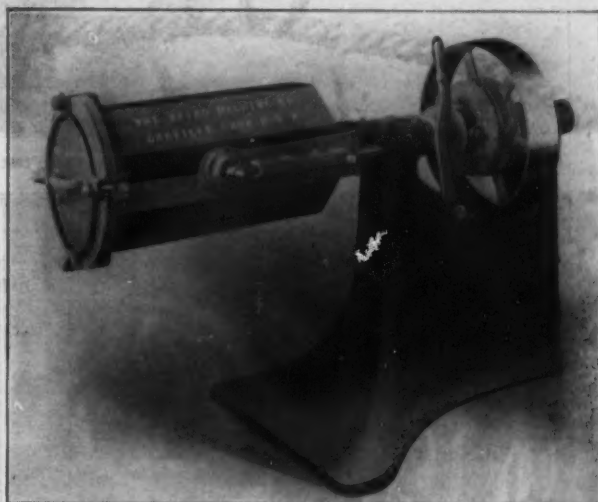
with a capital stock of \$800,000, to build a pipe line for natural gas between Canadian points. The line will be 80 miles long and 12-in. pipe will be used. Lemuel G. Neely is president.

A New Baird Ball Burnishing Barrel

For burnishing the output of small factories or experimental and special pieces for large firms a new kind of barrel has been built by the Baird Machine Company, Oakville, Conn. This new barrel is of the single type, but otherwise is the same as the double one illustrated in *The Iron Age* February 23, 1911.

The barrel proper is octagonal and is made of cast iron, with a maple wood lining, which is very durable. This type of construction enables all the parts subject to wear to be renewed easily and greatly prolongs the life of the machine. In use the barrel is kept in a horizontal position, but it can be easily tilted for emptying and filling, as trunnions near its center support it and connect it to a heavy yoke fastened to the driving shaft. A lock pin, engaging a recess on the side of the barrel near the lower end, keeps it in the horizontal operating position, and a slight push on the lever controlling the lock is sufficient to release the barrel for tilting. This type of locking device is convenient and simple, and at the same time holds the brass cover securely in position and prevents leakage. Another feature is the small amount of time required to operate it, and since the cover bolts are hinged to the barrel itself, the nuts have only to be loosened and not taken off, and there is no danger of any parts getting lost.

A friction clutch is used to drive the barrel, and in this way the driving pulley can be belted directly to the line shaft, thus eliminating a countershaft. All of the



The No. 1 S Burnishing Barrel Made by the Baird Machine Company, Oakville, Conn.

bearings in the barrel have bronze bushings of ample proportions, while those of the main shaft are provided with ring oilers. Two sizes of barrel are made, one measuring 10½ in. in diameter and 24 in. long, which is the one illustrated, and the other having a diameter of 16 in. and a length of 30 in. The builder has found that the use of a comparatively small diameter lessens the chances of denting or otherwise injuring delicate or small parts which are burnished, and at the same time the quality of the finish and the speed at which the work is turned out are not affected.

The Sharon Iron & Metal Company, Sharon, Pa., has been organized with a capital stock of \$50,000, to deal in scrap iron and steel and other metals. The company has taken over the business of Carnick Brothers & Speer in Sharon. It has secured the plant formerly occupied by the Damascus Brake Beam Company, which recently moved its business to Cleveland. The incorporators are Harry B. McDowell, George H. Allen, Glen Carley, H. W. Davis and Morris Speer.

The Libby 18-In. Turret Lathe

A New Tool for the Rapid Production of Duplicate Parts

A new turret lathe capable of handling heavy chucking and bar work and designed for the rapid and the accurate production of duplicate work has been placed on the market by the International Machine Tool Company, West Twenty-first street and Belt Railway, Indianapolis, Ind. This tool has a swing of 18 in. over the ways and can be arranged for either belt or motor drive. Fig. 1 illustrates the operating side of the lathe, while Fig. 2 is a rear view of the headstock showing the driving mechanism.

The headstock housing is cast integral with the bed which has heavy flat ways. Reinforcement is supplied by a rib extending through the center of the bed its entire length and cross ribs spaced every 13 in. The ways of the bed are flat and lie close to the bed proper. The

$7\frac{1}{2}$ hp. motor with a speed not exceeding 1800 rev. per min. is used. The spindle speeds vary from 8 to 300 rev. per min. with eight changes, and with a two-speed countershaft this number is doubled, and the range is from 6.4 to 300 rev. per min. Where a constant speed motor is used the spindle speeds are the same as those for the one-speed countershaft and can be varied still further by using an adjustable speed motor.

The chuck is of the three-jaw universal type designed especially for heavy service. Two or four-jaw independent or combination chucks can be employed if desired, and for bar work a collet chuck can be furnished.

The Tool Holding Parts

The tool post carriage is of the side carriage type and has a bearing on the front way $5\frac{3}{8}$ in. wide and 24 in. long. This bearing has a long taper gib on the side of the front way and is also gibbed to a 60-deg. angle on the lower side of the bed to take care of cross strains. In this type of carriage construction, the bearing, which in an ordinary engine lathe goes on the back way, is

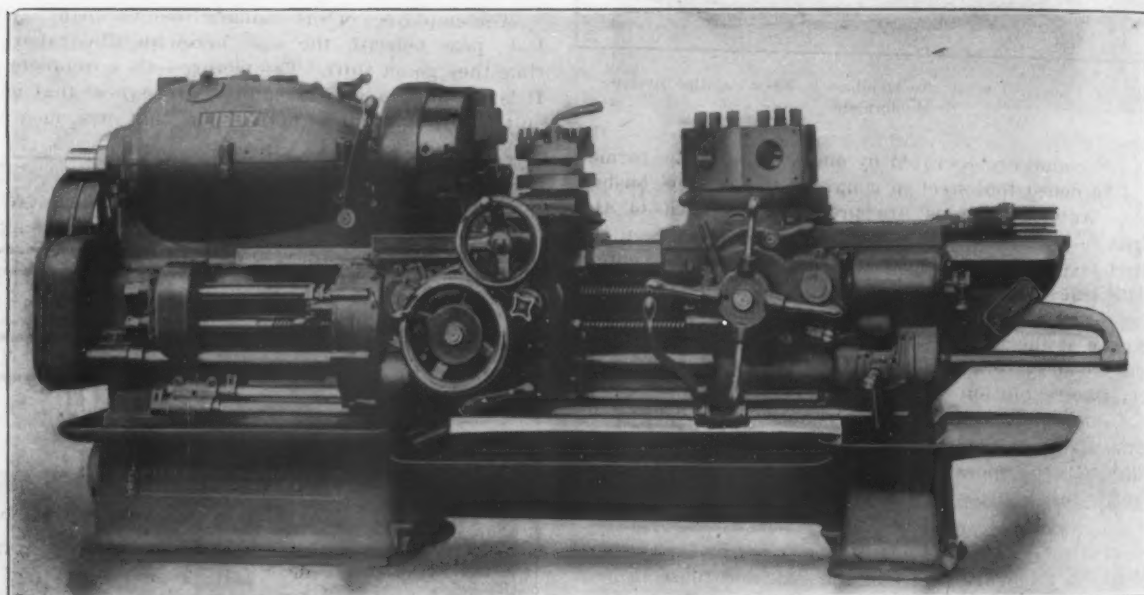


Fig. 1.—The Operating Side of the Libby 18-In. Turret Lathe Built by the International Machine Tool Company, Indianapolis, Ind.

width of the front way is $5\frac{3}{8}$ in. and that of the back one $3\frac{1}{8}$ in.

The Drive

In the headstock are two double frictions, one of which is a band friction in the driving mechanism and the other a cone friction on the intermediate shaft. The former is on a shaft running at 480 rev. per min., and the latter is on a shaft, the lowest speed of which is 240 rev. per min. These frictions give the operator complete control of the spindle, and the chuck and the locking mechanism are of such a design as to produce the effect of a positive clutch. All parts of the friction dogs subjected to wear are made of hardened tool steel. The main spindle is of 0.4 per cent. carbon steel and has a $3\frac{1}{8}$ -in. hole through it. It is carried in large bronze bearings, adjustable for wear and ring oiled.

The single belt drive mechanism is entirely separate from the headstock proper and is fitted into a housing, which is cast solid with the bed and the headstock, so that it can be removed for repairs or adjustments. It includes two friction gear drives transmitting power to the intermediate shaft, giving two speeds in a forward direction and in conjunction with the four mechanical speed changes of the headstock renders eight forward speeds available. The lathe is driven by a belt from a one or two speed countershaft, or else by an electric motor. If a one-speed countershaft is used, the drive is through a 4-in. belt to a 16-in. pulley, which drives the high-speed shaft at 480 rev. per min. When a two-speed countershaft is used, the first speed is the same, and the second one is 384 rev. per min. For motor drive a 5 or

transferred to a bearing on the bottom of the side of the bed, an arrangement which gets the cross slide out of the way and renders the full swing capacity of the lathe available. Another advantage of this construction is that the necessity of long overhanging tools is done away with, as the tool post can pass the chuck and the turret and come up flush to the former. Each carriage has a rapid power traverse which operates at the rate of 40 ft. per minute and stops instantly when thrown off. The traverse for each carriage is entirely independent of the other and can be operated in either direction, irrespective of whether the feed is engaged or not and what the other carriage is doing. The mechanism for this rapid traverse is driven from the main driving shaft of the lathe and does require a separate countershaft or motor. In operation none of the headstock gears or feed gears are included with the result that neither the pilot wheel on the turret slide nor the hand wheel of the tool post carriage turn or move when the rapid traverse is in use.

A rectangular turret type tool post is used which will carry four tools at one time, each being independently adjustable for height. It is very rigid and has a double acting clamping device operating on both the inside and the outside, so that broad faced tools can be used. Both cross and lateral power feeds are provided, as well as a rapid lateral traverse which is entirely independent and will operate in either direction whether the feed is engaged or not. The tool post can be locked in eight different positions and if desired can be clamped in intermediate ones. A hollow hexagonal turret 12 in. in diameter is used with a $3\frac{1}{4}$ -in. hole in each face. The lock

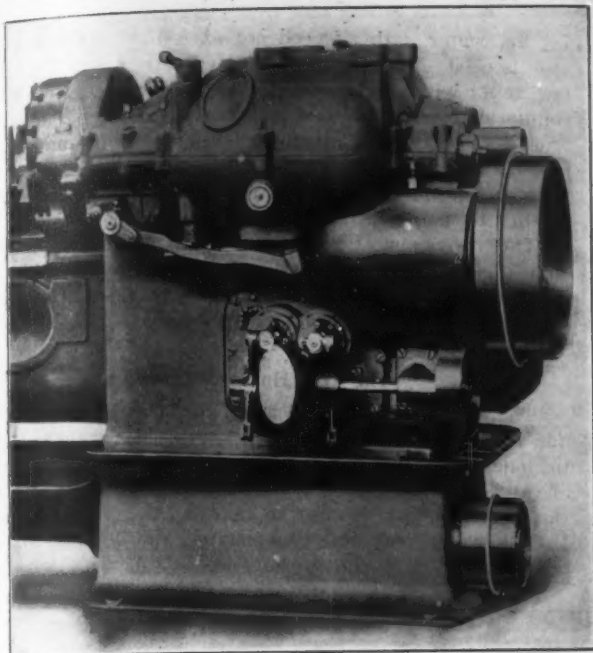


Fig. 2.—Rear View of the Headstock, Showing the Driving Mechanism.

pin and clamp are operated by one lever, and the former is of hardened tool steel in a hardened tool steel bushed hole. Automatic stops are provided for each of the turret faces. A 10-in. die head can be mounted on the turret face and swing clear of the ways, as the centers of the holes in the turret faces are 9 in. above the ways. The turret is operated by hand and has rapid power traverse at the rate of 40 ft. per minute in either direction, irrespective of whether the feeds are engaged or not. One revolution of the pilot wheel moves the turret 1 in. and gives a powerful leverage when coming up against a heavy cut. A sight indicator is furnished which tells the operator the depth of the cut if he should want to use it after the turret stop has operated.

Other Features

All the feeds are positively geared, and those in each apron are entirely independent of the other, both as regards amount and direction. Nine feeds ranging in either direction from 0.25 to 0.00391 in. per minute are available for the turret, while the tool post carriage has six feeds ranging from 0.25 to 0.00781 in. per minute. The tool post carriage cross feeds are one-half the longitudinal feeds, but if desired can have the same range as the turret feeds and are reversible. Hand feeds are also available, one revolution of the wheel moving the carriage 1 in. Automatic feed trips are furnished for each turret face and laterally for each tool post face. After these trips have operated, an index pointer on a graduated scale on the turret indicates the amount of cut taken which is a great convenience in forming work to an accurate depth and thickness. Seven change gears are furnished, and any of the ordinary pitches of screw thread can be cut, including an 11½ pipe thread.

A steady rest which has a three-jaw universal chuck is feathered to a heavy shaft on the back of the machine, so that when in use it is clamped to the back way and rests firmly upon it. When in use it is not fastened to and does not interfere with the use of any other part of the machine and can be thrown back out of the way when not being used.

Cast iron oil pans are placed at a convenient height from the floor and the cutting lubricant drains into a large pan in the center of the machine containing a strainer. From here the lubricant flows into the front leg of the machine which contains the reservoir, and from the latter is pumped back to the work by a rotary pump located on the back of the machine and driven from the rapid traverse shaft. A pressure valve is provided for the pump, and when the flow is shut off at the work the lubricant is by-passed back to the reservoir. One of the special features of the lathe is an exceptionally complete

lubricating system for the running part. Ring oilers fed from reservoirs having sight gauges are employed for the main bearings, and the oil is distributed on the shafts by a system of spiral grooves. All the parts of the apron, the feed box and the rapid traverse requiring lubrication have oil tubes leading to them.

The following table gives the principal dimensions and specifications of the lathe:

Swing over ways, inches.....	18
Swing over carriage, inches.....	16
Overall length, feet.....	10
Travel of turret, inches.....	40
Travel of carriage, inches.....	40
Diameter of hole in spindle, inches.....	3¼
Diameter of hole in turret face, inches.....	3¼
Diameter of chuck, inches.....	16
Width of driving belt, inches.....	4
Shipping weight, pounds.....	6,000

The regular equipment of the machine includes either a one or two speed countershaft as may be desired, but brackets for motor drive can be supplied to order instead.

A Suggestive Antiaccident Epigram

The employees of the Indiana Steel Company, at Gary, Ind., pass beneath the sign herewith illustrated every time they go on shift. The picture tells a complete story. It is not only a caution against carelessness that may result in injury, but a notification that workmen whose



carelessness may cause an accident are not desirable employees.

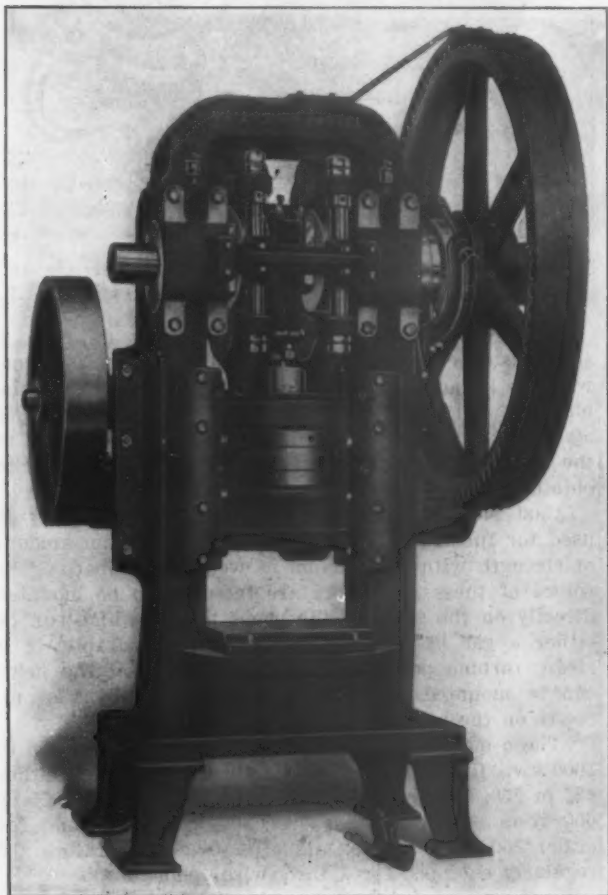
American Society for Testing Materials.—The fourteenth annual meeting of the American Society for Testing Materials will be held at the Hotel Traymore, Atlantic City, N. J., Tuesday to Saturday, inclusive, June 27 to July 1. This year it is expected that most of the papers and committee reports will be printed and circulated in advance of the meeting. The present membership of the society is 1342.

The Board of Trade of Easton, Pa., has acquired a large tract of land in the suburbs of that city, with a spur connecting with the Lehigh Valley Railroad. The Board of Trade has \$600,000 available capital for the purpose of promoting industrial enterprises seeking locations. It is its intention to furnish sites, take stock and assist in every way possible those who would locate there.

The Waterbury Cam Pillar Press

A line of double-acting cam pillar presses known as the special No. 8 press is being built by the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn. They are used for heavy cutting, forming and drawing, and have a capacity for drawing or cutting steel shells 4 in. in diameter, $\frac{1}{4}$ in. thick and 2 in. deep. The No. 4160 machine, which is one illustrated, is used for drawing shells where they pass through the die and strip from the punch, falling through the bed of the press into some receptacle placed beneath it.

The construction of the machine is very rigid to withstand the severe work to which it is subjected and to develop the necessary power, back gears are used. Round nuts having holes for use with a pin wrench provide for the adjustment of the cutting slide up and down the



The No. 4160 Double Acting Cam Pillar Press Built by the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn.

sleeve. This sleeve is attached to the yokes against rolls in which the cams act, an arrangement which keeps the bottom of the cutting slide always parallel with the bed of the press. The center or drawing slide is driven by a ball connection.

Another type of press known as the No. 4182 is employed for cupping and forming, and is equipped with a single motion and a cam actuated knock-out for lifting the shells from the die. On this machine the cutting slide remains down after cutting the blank until the center slide has operated and has risen 10 degrees.

The cams in both of these machines are of hardened tool steel, while the rolls are bronze bushed and revolve on hardened and ground tool steel pins. The crank shaft runs in bronze lined capped bearings, and the back shaft in bearings lined with babbit metal.

The following table gives the principal dimensions and specifications of the two presses:

	No. 4160.	No. 4182.
Distance from bed to center of crank shaft, inches	56 $\frac{1}{4}$	58 $\frac{1}{4}$
Distance from bed to cutting slide when down, inches	12	13 $\frac{1}{4}$
Distance from bed to drawing slide when down, inches	13	16 $\frac{1}{4}$

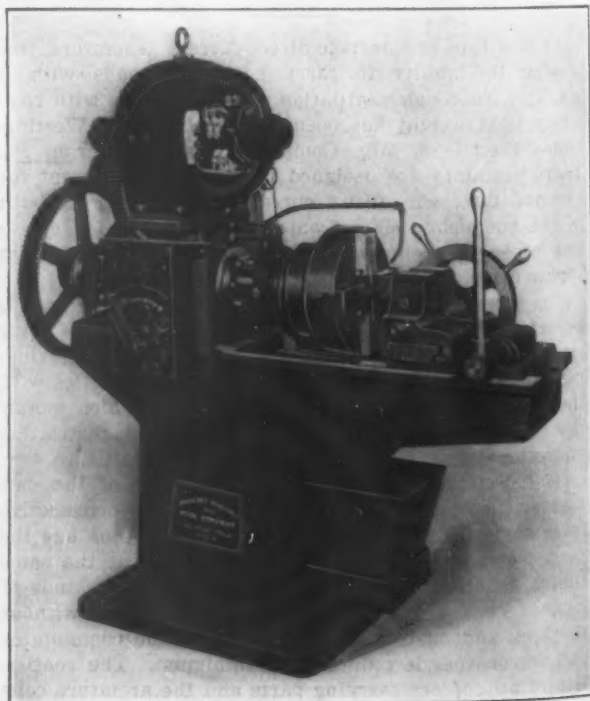
Standard length of cutting slide stroke, inches.	2	3 $\frac{1}{2}$
Standard length of drawing slide stroke, inches.	9	8
Distance from bed to bottom of ways, inches.	12	13 $\frac{1}{4}$
Distance between ways, inches.	20	20
Depth of bottom of cutting slide, inches.	13 $\frac{1}{4}$	14
Diameter of bottom of drawing slide, inches.	7	7
Distance between uprights at bed, inches.	25	25
Depth of top of bed, inches.	24	24
Diameter of opening through bed, inches.	9	9
Length of knock-out stroke, inches.	3	3
Thickness of bolster plate, inches.	3 $\frac{1}{4}$	4
Cross section of uprights, inches.	11 $\frac{1}{2}$ x 7	11 $\frac{1}{2}$ x 7
Floor space required, inches.	75 x 82	73 x 80
Overall height, inches.	120	123
Diameter of flywheel, inches.	30	38
Face width of flywheel, inches.	6 $\frac{1}{2}$	6
Ratio of gearing.	17.7 to 1	17.7 to 1
Weight of flywheel, pounds.	600	680
Weight of press, pounds.	19,850	22,630

The equipment of the presses includes the builder's patented Johnson clutch and a set of wrenches for making all the necessary adjustments. As these presses are generally built to order, the bottom of the drawing slide can be made to suit any tool which the purchaser is using at the time the order is placed.

The Murchey Motor Driven Pipe Threader

A new single head motor driven semiautomatic pipe threading machine designed especially for mill and factory work has recently been placed on the market by the Murchey Machine & Tool Company, Detroit, Mich. It is rigidly built to withstand the hard and continuous service required of a machine in constant operation and one of the chief features claimed for it is the rapidity with which it turns out work. In general construction and mechanical operation, the threader is similar to the No. 2 semiautomatic double head nipple and pipe threading machine made by this company. The die head with which both of these machines are equipped is of the maker's improved automatic opening type which was described in *The Iron Age*, June 3, 1909.

The construction of the machine throughout is heavy, and the semisteel journal bearings are of ample proportions, measuring 4 x 20 in. Machine cut gears with wide faces are used for transmitting power. The capacity of the threader ranges from $\frac{1}{2}$ to 2 in. pipe, which it will thread and ream in one operation. It will cut threads of uniform size and length on pipes ranging from a close nipple to a full length pipe, and it is claimed that it is possible to cut 2000 1-in. standard threads per hour.



A New Motor Driven Semi-Automatic Pipe Threading Machine Built by the Murchey Machine & Tool Company, Detroit, Mich.

After the work is started in the die head, which is simply and strongly constructed and has few wearing parts, no further attention is required. The die head is composed of four principal parts: the body, the sliding collar, the adjustable shell and the die holders, and the adjustments for the different sizes and lengths of thread and the amounts of internal reaming for the end of the pipe are few in number and easily and quickly made. The dies are made of tool steel with plain straight backs, which are firmly held in position by a pointed set screw which enters a pit in the die so that the latter can be changed quickly. A special design of reamer is used, which can be quickly removed and easily sharpened without altering its form.

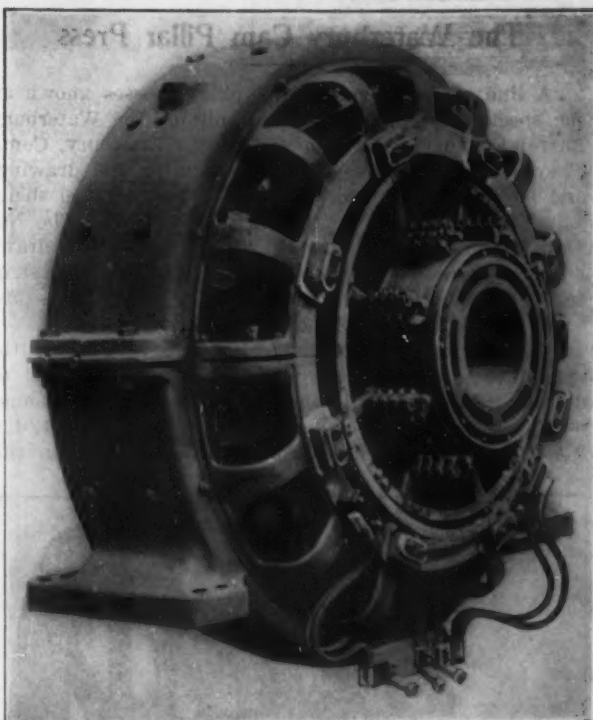
The quick-acting chuck has jaws of the chisel grip type that will not crush the pipe but will nevertheless grip it strongly with a slight pressure and can be easily sharpened on an emery wheel without drawing the temper. The jaws, a set of which is furnished for every size of pipe within the capacity of the machine, have long and rigid bearings and to prevent them spreading, the gripping screw is placed close to the work. The tempered tool steel threaded nipple tool holders employed for close nipples are made in halves and will grip the threaded end of the pipe without special attention on the part of the operator. For holding short nipples or long lengths of pipe, the regular gripping jaws are used and the projection of the pipe through these has no effect on the length of the thread. The reaming of the internal wall of the pipe is done at the same time that the thread is being cut, and there is an independent adjustment of the reamer for taking either light or heavy cuts as is desired. For cutting running threads 4 in. long, the reamer holder can be quickly removed. Bolt threading can also be done by this machine, but the rate of production is not as rapid as when it is employed for pipe threading.

The weight of the threader is approximately 1700 lb., and the floor space required measures 2 x 5 ft. When supplied with a motor, as shown, an adjustable speed 2-hp. motor having a speed variation of 4 to 1 is directly connected to the three-step cone pulley through a standard geared drive. If desired the machine can be furnished without a motor, and the speed of the countershaft is 200 rev. per min. The equipment of both types of threaders includes an automatic oil pan, a pump, an oil well and a drip pan.

The New Westinghouse Interpole Direct Current Generators

A new type of Interpole direct current generators, possessing the ability to carry heavy overloads without sparking, thorough ventilation and ruggedness with relatively light weight has been developed by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. These machines are designed for furnishing current for two and three wire direct current systems, and are built in the customary sizes from 25 to 1000 kw. for operation at speeds conforming to the standard practice for engine drive.

In these machines, which are known as the type Q generators, sparkless commutation is secured by using small poles located between the main ones. The windings of these auxiliary poles are connected in series with the armature and set up a magnetic field, which annuls the effect of the field formed by armature magnetization and generates in the commutated armature coils an electromotive force which assists the reversal of the current at the instant of commutation. This electromotive force varies in proportion to the load and thus has the proper corrective effect at all loads, while at the same time a definite brush position is secured for all kinds of loads. Thus heavy overloads can be carried without sparking and flashing, and the wear on the commutator and the brushes is reduced to a minimum. The ventilation of all current carrying parts and the armature coils has received particular attention in designing these machines. All the windings are designed to give shallow coils, and the heat in any part has but an extremely



The New Type Q Engine Driven Direct Current Interpole Generator Built by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

short distance to travel before reaching the surface from which it is radiated. This feature of the design in combination with a very complete and thorough system of air circulation, it is claimed, prevents hot spots and at the same time secures a uniformity of temperature not obtained prior to this time.

Cast steel having a high magnetic permeability is used for the frames and furnishes a maximum amount of strength with a minimum of weight and space. The rotors of these generators are intended to be mounted directly on the shaft of the prime mover, which can be either a gas or a steam engine or an hydraulic or a steam turbine possessing the proper speed. The fields can be mounted either on masonry foundations or directly on the bed plate of the prime mover.

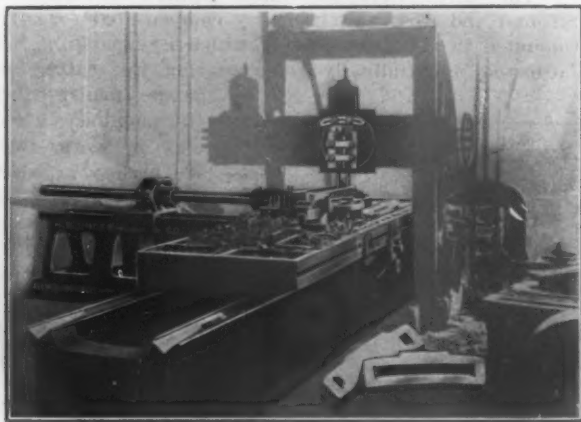
These machines are built in sizes ranging from 25 to 1000 kw. Up to 100 kw., the standard voltages are either 125 or 250, and from 100 to 300 kw. they are 125, 250 or 600 volts. All machines over 300 kw. are wound for either 250 or 600 volts, and all 250-volt generators are regularly equipped for a three-wire operation.

Wm. H. Washburne, formerly vice-president and sales manager of the Pyott Company, Chicago, has severed his connection with that company to engage in business for himself as direct mill representative. Offices have been established at 1030 Old Colony Building, Chicago, and Mr. Washburne will represent the following companies in the sale of the products mentioned in the Chicago territory: Beall Bros., Alton, Ill., shovel picks, spades, &c., blacksmiths' and miners' tools; Graves & Stamp, Desarc, Mo., hickory handles; Wm. Ganschow & Co., Chicago, metal and rawhide gears; Pyott Company, Chicago, power transmission appliances; Pyott Foundry Company, Chicago, general machinery castings; Sanford-Day Iron Works, Knoxville, Tenn., mining and dump cars, mining machinery, &c.; Highland Chemical Products Company, Connellsville, Pa., noncorrosive paint.

The Lufkin Foundry & Machine Company, Lufkin, Texas, has increased its capital stock from \$120,000 to \$200,000. The company states that the increase is for the purpose of meeting the demand of its fast growing trade. It recently erected a large brick and steel boiler and blacksmith shop, which has been equipped with new tools, and also increased the facilities in its foundry and machine shop. A large warehouse will probably be erected within the next year.

The Allner-Boswell Radius Planer Attachment

Various machines and methods have been tried at different times for machining motion links and obtaining the proper curve in the slot, but it has been demonstrated that for rapid and accurate work a device embodying the following six points should be used. The features which such an attachment should possess are an absolutely correct circle radius, a rigid construction, a wide range of adjustments for the rigging, absence of wear on all parts that might impair the accuracy of the curve, easy



The Allner-Boswell Radius Planer Attachment Manufactured by H. B. Underwood & Co., Philadelphia, Pa.

adjustments to radii of any length and interchangeability with straight planer work and a concentrated method of curve cutting so that the whole operation can be finished in one setting. In the Allner-Boswell radius planer attachment made by the H. B. Underwood & Co., 1026 Hamilton street, Philadelphia, Pa., all these points are said to have been covered.

This attachment enables very heavy cuts to be taken, and stands up to the limit of the machine tool without injury. A square block which is integral with the bottom plate that is fixed to the planer table transmits power for driving the top plate in the direction of the reciprocating movement. In this way the resultant of this force, combined with the resistance offered to the tool by the cut, is parallel with the motion of the tool, and the oscillating component of the mechanism is taken care of by an enlarged pin that surrounds the square block. This pin passes through an enlarged eye, and a retaining ring on the upper side of the eye forms the setting table. All the parts subject to stress have ample dimensions. The radial bar is subjected to very little stress, and on that account is made in the form of a comparatively light tube which is easily handled. This arrangement enables the adjustment for radii of different lengths to be secured by a guide that is double pivoted in a post sliding on a foot plate perpendicular to the movement of the planer tool.

After the link has been planed and milled around the edges and the end clearances drilled and slotted, it is set up on the chuck table by lining it up to a center line marked on the chuck. The center block is removed by parting with two tools simultaneously, and this operation, including the setting up of the link and lifting out the block after parting has been accomplished with a 3½-in. hammered steel link on a 15-hp. planer in 35 minutes. After parting the slot is finished by side tools kept steady in the other heads of the planer. In this way only one setting is required for blocking out and finishing both sides of the link, and at the same time absolutely correct inside and outside radii are secured.

The Firth-Stirling Steel Company's New Hand-Book.—The Firth-Stirling Steel Company, whose plant is at McKeesport, Pa., manufacturer of Blue Chip high speed steel and high grade tool steels for all purposes, has issued through its sales representatives, E. S. Jackman & Co., with offices in Chicago, Cleveland and Pitts-

burgh, its new 1911 copyrighted hand-book, consisting of 64 pages, 3½ x 6½ in. The subjects treated include Blue Chip steel, tempering, special tool steel, alloy steel, stock list, extras, disc lists, drill rods, tables, memoranda, &c. It will be found of interest by every superintendent and manager of plants using tool steels in any form.

An Exceptionally Small Toledo Electric Welding Machine

A new welding machine, the special features of which are light weight and exceptionally small size, has been recently brought out by the Toledo Electric Welder Company, Cincinnati, Ohio. It is a small machine designed for butt welding stock ranging from No. 16 gauge wire to ¼-in. round iron or steel and weighs about 100 lb., as aluminum is employed in the construction of the case.

In operation the stock is clamped in the jaws of the welder by the lever handles at the top of the machine. The semiautomatic switch or compression lever at the right of the machine is moved toward the operator and the stock instantly begins to heat. When it has softened sufficiently, the ends are forced into contact with each other and the switch is then opened.

The time required to place stock in the jaws and complete the weld is from 3 to 5 seconds, and the cost



The No. 0 Electric Welding Machine Built by the Toledo Electric Welder Company, Cincinnati, Ohio.

for current based on a rate of 5 cents per kilowatt-hour is 35 cents per 1000 welds of the maximum size handled by the machine. This cost is proportionately lessened with a decrease in the size of the stock, since the current consumption decreases in direct proportion. To cut down the amount of current used when stock of a smaller size than the maximum capacity of the machine is to be welded a regulator is furnished as part of the equipment of the welder.

The following table gives the principal dimensions and specifications of the welder:

Distance from floor to center of jaws, inches.....	12½
Distance from floor to top of machine, inches.....	16½
Depth of jaw opening, inches.....	¾
Width of jaw opening, inches.....	1
Size of dies, inches.....	¾ x ¾
Floor space, inches.....	11 x 8
Weight of machine, pounds.....	100

The No. 5 Cincinnati Gear Cutter

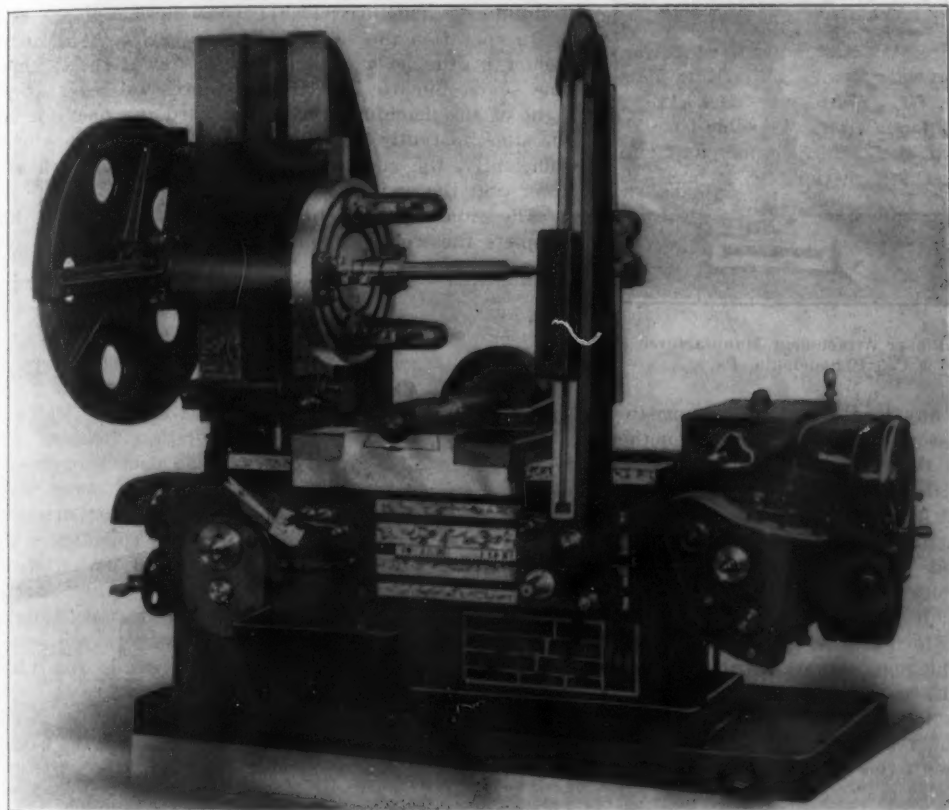
A New Size of a Standard Automatic Machine

A new size of gear cutter capable of handling 16 x 48 in. blanks has been brought out by the Cincinnati Gear Cutting Machine Company, Elam street and Garrard avenue, Cincinnati, Ohio. It is a larger size of the builder's standard line, and like the No. 3A cutter which was illustrated in *The Iron Age*, September 30, 1909, in designing it an effort was made to secure rigidity, ample wearing surfaces and simplicity of parts. The power is transmitted from a single pulley running at a constant speed, and the various feeds and speeds are obtained by conveniently located transposing gears. All gibs are of the taper type and can be adjusted from the ends and

five to one, which reduces any binding action. The slide is fed forward and retracted by a screw. The adjustable dogs controlling the length of the cutter slide feed are operated by a crank wrench from the front of the bed and a retractable tappet for the dogs enables the slide to be run to the extreme rear position without disturbing the setting of the dogs when it is necessary to remove the blanks. For moving the slide by hand an automatic disengaging crank is provided. Twenty-four feeds arranged in two series of 12 each are provided for the cutter slide, which returns at a constant speed regardless of the rate at which it is fed forward. The extreme feeds are $\frac{1}{2}$ in. and $15\frac{1}{2}$ in. per minute.

The large diameter cutter spindle is accurately ground and wear can be easily compensated for. It is mounted in a bronze bearing which is capable of being adjusted longitudinally for centering the cutter to a gauge furnished with the machine. A worm and a worm wheel are used to drive the spindle and any wear due to the end thrust of the worm can be taken up. For receiving the cutter arbor, which is keyed in the spindle and is drawn in and forced out by a threaded bolt, the cutter end of the spindle has a No. 11 Brown & Sharpe taper. A $1\frac{1}{2}$ in. arbor is regularly furnished, but if desired others can be substituted, all of which are supported at the outer end by a removable bearing. Six spindle speed changes, ranging from 24 to 120 rev. per min., are available.

The construction of the indexing mechanism is very simple and it is claimed that there are fewer gears in the train than in any other machine on the market. If desired the index worm can



The No. 5 48 x 16 In. Gear Cutter Made by the Cincinnati Gear Cutting Machine Company, Cincinnati, Ohio.

all the shafts and the spindles are accurately ground and journaled in bronze bushings. All of the movements are automatic, each depending upon the preceding one and being prevented from taking place until that has been completed.

The work saddle is attached to the housing by gibs in such a way that the work arbor and the blank do not drop out of parallelism when the clamps are loosened for adjusting the work for the tooth depth. A single lever operates the power elevating device for the work saddle in either direction, and when the device is not in use no gears are running. A separate belt is not required for this device, as the power to operate it is taken from the machine pulley. A hand adjustment and a micrometer collar graduated to 0.001 in. are also furnished. The steel work arbor is accurately ground and journaled in bronze bushings and is provided with means for taking up wear. It is drawn in and forced out by a threaded shaft and a hand wheel. A face plate with a series of concentric T-slots and slotted dogs and jacks which can be clamped in any position on the face plate to permit of radial adjustment are furnished. A counterweight which is guided in a dovetail slot is provided for the work arbor support.

Rectangular guiding surfaces with long taper gibs for taking up wear, both vertically and horizontally, are provided for the cutter slide. The proportion between the length and the width of these guiding surfaces is

be quickly disengaged from the wheel and brought back into the exact meshing depth or it may be disengaged from the index gears, rotated any desired amount for resetting work and again secured to the gears. The feed for the cutter slide and the indexing mechanism are interlocked in such a way that it is impossible for cutter to advance until the work is properly indexed or when the cutter is feeding to index, thus preventing work from being spoiled. A hand movement under the control of the operator enables the work spindle to be spaced once or to revolve continuously. All numbers of teeth from 12 to 100 and from 100 to 450, with the exception of prime numbers and their multiples, can be cut by the index change gears regularly furnished. For cutting other numbers of teeth special gears can be supplied at an additional cost if desired.

The following table gives the principal dimensions and specifications of the cutter:

Maximum diameter of gear blanks, inches.....	48
Maximum face width of gear blanks, inches.....	16
Number of cutter slide feed changes.....	24
Minimum cutter slide feed, inches per minute.....	$\frac{1}{4}$
Maximum cutter slide feed, inches per minute.....	$15\frac{1}{2}$
Brown & Sharpe taper of work arbor.....	No. 10
Brown & Sharpe taper of cutter spindle.....	No. 11
Diameter of cutter arbor, inches.....	$1\frac{1}{2}$
Number of cutter spindle speeds.....	6
Minimum cutter spindle speed, revolutions per minute....	24

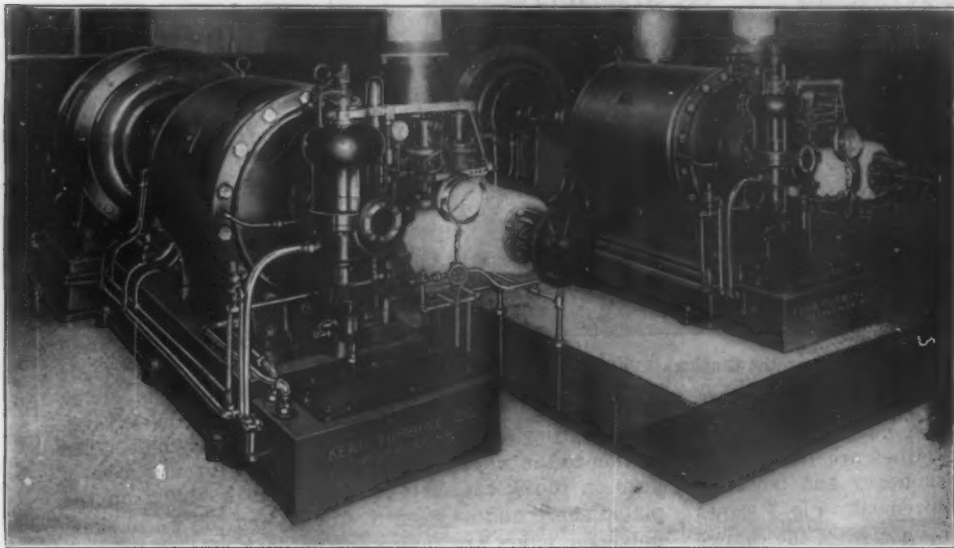
Maximum cutter spindle speed, revolutions per minute....	120
Diameter of countershaft pulleys, inches.....	18
Face width of countershaft pulleys, inches.....	5 1/4
Speed of countershaft pulleys, revolutions per minute....	285
Floor space required, inches.....	101 x 53
Net weight of machine with countershaft, lb.....	7,740

The equipment regularly furnished with the machine includes an outer support for the work arbor and a rim support for the gear blanks together with a countershaft and tight and loose pulleys. If desired the machine can be furnished with the tight and loose pulleys mounted on the initial shaft and it can also be arranged for motor drive.

Kerr Turbines in the New York Post-Office

As few of the Government buildings are equipped with steam turbines for lighting purposes, the recent installation of two turbo generating units in the New York Post-Office is interesting. These supply current to the Moore vacuum tube lighting system, and each consists of a 200-kw. steam turbine built by the Kerr Turbine Company, Wellsville, N. Y., direct connected to a Crocker-Wheeler generator mounted on the same base.

The turbines use steam at 135 lb. pressure and run noncondensing. The governing mechanism is particu-



The Turbo-Generators Supplying Current to the Moore Vacuum Tube Lighting System in the General Post-office, New York City. These Units Were Built by the Kerr Turbine Company, Wellsville, N. Y.

larly sensitive and prevents any racing due to sudden changes of load. In fact, the extreme variation in speed from no load to full load does not exceed 2 per cent., and the momentary variation during any fluctuation within the rated capacity does not exceed 5 per cent. The regulation is secured by a governor of the centrifugal type actuating the throttle valve through a system of levers to regulate the admission of steam as required by the load. In addition there is an emergency stop governor which instantly shuts off the steam if the load drops suddenly or an excessive speed is reached.

The generators are of the revolving field type and deliver two-phase, 60-cycle, 230-volt alternating current. The frames are circular in form and possess high permeability, the field coils being wound on spools mounted on steel laminations with the windings carefully insulated. The armature spiders are of cast iron with the laminations and the windings constructed to produce a perfect mechanical and electrical balance. Air ducts provide a free circulation of air around the ends of the windings through openings in the outer frame. A separate direct current 125-volt unit mounted on each generator shaft furnishes the necessary excitation to maintain a pressure of 230 volts at the generator terminals. The excitation has a wide range, enabling the voltage to reach as high as 230 or as low as 200 under normal speed and full load conditions.

Before the turbines and the generators were accepted by the Treasury Department, both were tested at the

shops of their respective builders by Government inspectors. The turbines were tested for steam consumption per brake horsepower with a prony brake at 25, 75, 100 and 125 per cent. of their rated load at a steam pressure of 135 lb. and a 30-degree superheat. The following results were obtained:

Load.	Pounds of steam per b.h.p. per hour.	
Per cent.	Turbine 1.	Turbine 2.
50	44.6	43.6
75	40.6	41.2
100	38.4	38.7
125	39.3	38.9

The generators under test showed efficiencies of 89.6 per cent. at one-half load, 92.4 per cent. at three-quarter load and 93.9 per cent. at full load. They were designed to run continuously for 12 hours at full rated current output with no part of the armature or field coils showing a temperature rise above the surrounding air of 35 degrees C., and they can carry a 25-per cent. overload for two hours, without injurious heating, successfully.

The American Association of Commerce and Trade, Berlin

For the purpose of aiding American manufacturers and business men in introducing their wares into Germany, the American Association of Commerce and Trade was organized in Berlin eight years ago by American business men having trade relations with the German Empire. The association, carried on as an American Chamber of Commerce, with its Board of Directors and its committees, is doing an unselfish work in aiding American manufacturers. The secretary, George S. Atwood, for the past 20 years in close touch with the German business world and the German Government departments, is able to answer promptly all inquiries and save time in the establishment of American branches. The association is a live organization, as frequently evidenced by the gatherings of business men at its fine quarters, 59, 60 Friedrich-Strasse, Equitable Building, and at a very recent date by its dinner given to its Hamburg members at Hotel Atlantic, Hamburg, when the American ambassador, the presiding burgomasters of Hamburg and Lubeck, the presidents of the Chambers of Commerce in these cities, and representatives of the Hamburg-America Line and Hamburg's leading bankers and financiers were present as guests of the association. Its work extends over the entire United States and throughout Germany. It invites American business men to seek its help.

The Boston office of the Triumph Electric Company, Cincinnati, has been removed from 101 High street to 92 Pearl street. C. A. Cotton is district office manager. This change of location was made necessary by the large increase in the volume of business and the necessity of having larger and more commodious quarters.

The Warwood Tool Company, Warwood, near Wheeling, W. Va., manufacturer of hammers and track tools, recently struck gas on its property. The well showed a pressure equal to 4,000,000 cu. ft. of gas per day, which will be utilized in the heating furnaces of the plant. While the supply will likely last for several years, the company intends to drill another well.

The Cincinnati Heavy Duty Pulley Lathe

The Cincinnati Pulley Machinery Company, Cincinnati, Ohio, has recently designed a line of all geared heavy duty pulley lathes. Roughing cuts with a fine feed have to be taken on a machine of this character, and the finishing cut with a broad nose goose neck tool is

turn drives a worm and worm wheel in the apron. This worm wheel has a friction, and spur gears on the friction disk mesh with gears on the tumbler plate, which can be thrown to furnish a feed in either direction to the top slide. From this plate the power is transmitted to the gears on the cross feed screw.

The lathe has a three-step cone pulley and a two-speed countershaft, the speeds of the latter being 225 and

300 rev. per min.

This combination gives six spindle speeds ranging from 7 to 30 rev. per min. The power is transmitted from the cone pulley shaft through gearing to a large intermediate gear, and from there to the intermediate gear A, Fig. 2. This in turn meshes with the gear B on the clutch gear in the gear box. When the lever in the gear box is thrown to the right, the clutch is engaged with the clutch gear transmitting motion to the tumbler shaft, which has four gears mounted upon it. By bringing these into mesh with the four gears on the cone shaft, six feeds are obtained, while throwing the lever in the opposite direction renders six more feeds available, thus giving 12 feed changes, rang-

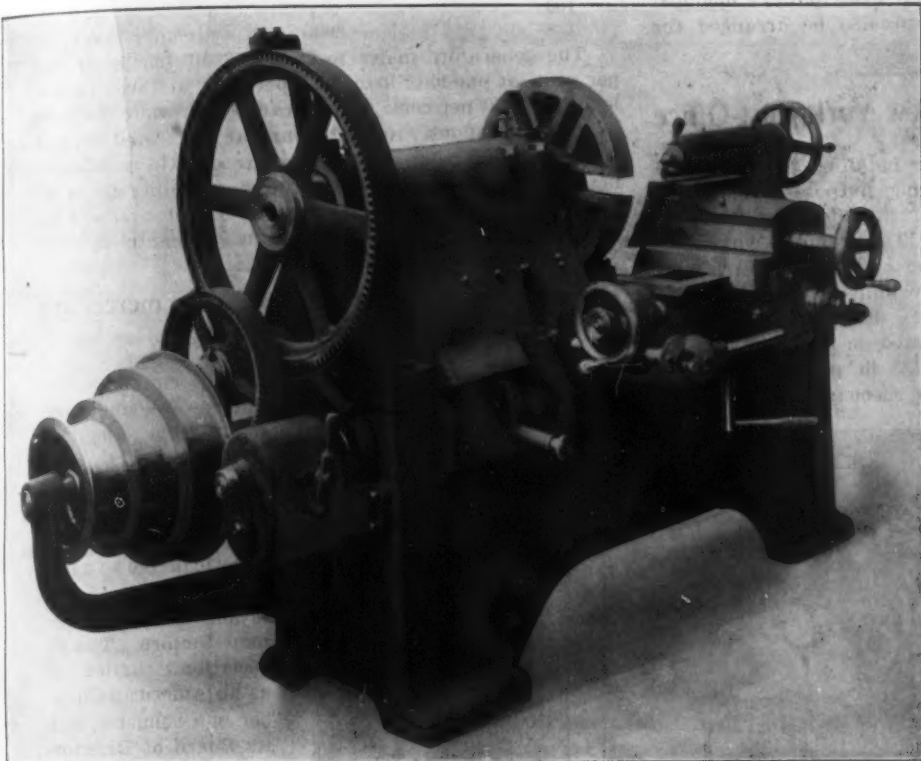


Fig. 1.—A New Heavy Duty Pulley Lathe Built by the Cincinnati Pulley Machinery Company, Cincinnati, Ohio.

very sweeping, so that the tool must have a wide range of positive feed changes. These lathes are intended to meet the increasing demand for a heavy and powerful tool possessing this important requirement. Fig. 1 shows a typical machine, while Fig. 2 gives a view of the change gear mechanism.

The lathe illustrated in Fig. 1 will turn gears, flywheels and pulleys having a diameter of 20 in. and an extreme face width of 14 in., and has 12 feed changes,

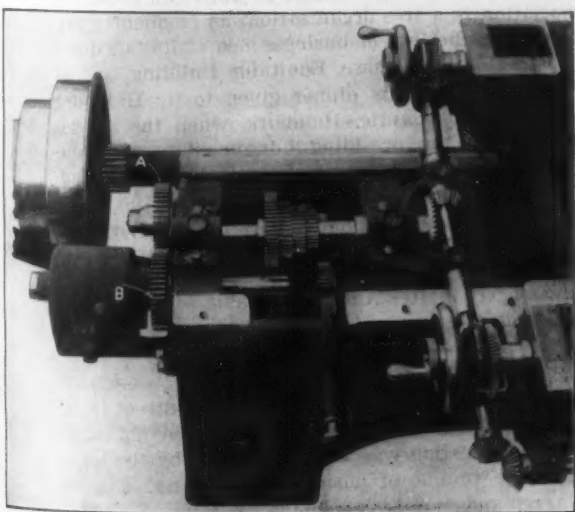


Fig. 2.—The Change Gear Mechanism.

ing from 1-32 to $\frac{1}{2}$ in. per revolution of the spindle. The motion to the worm shaft is transmitted through a bevel gear on the worm shaft meshing with a pinion on the pinion shaft, and between the pinion and the worm shaft universal joints are interposed on each side of the machine to care for changes in the position of the latter shaft when the table is swiveled.

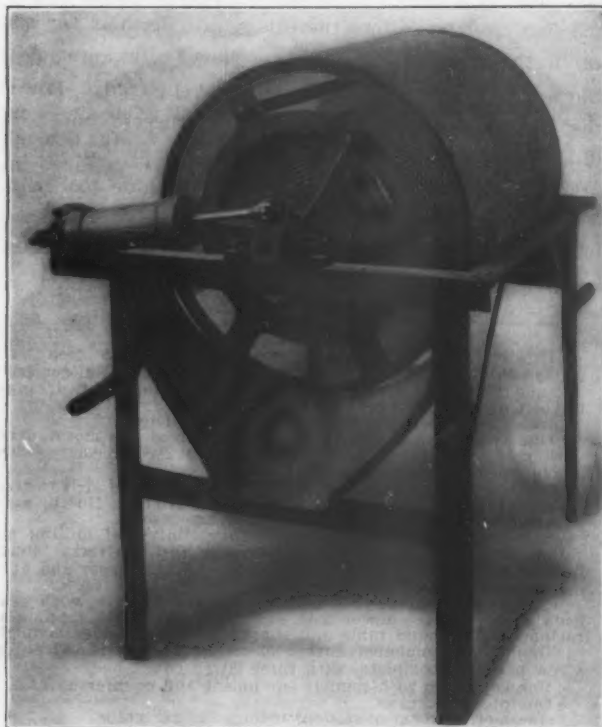
The Allen-Bradley Company's Electrical Products.

—McCoy & Brandt, House Building, Pittsburgh, dealers in new and second-hand machinery, represent the Allen-Bradley Company in the Pittsburgh district in the sale of that company's controlling apparatus, in which is incorporated the well-known graphite compression resistance of which the company is the sole patentee and exclusive manufacturer. Its products include constant speed rheostats, automatic overload releasing rheostats and rheostat panels and a complete line of alternating current rheostats and reversing controllers for crane and similar reversing motor duty. It will also soon commence the manufacture of a line of automatic motor controlling rheostats. The Allen Bradley Company is located at Milwaukee, Wis., occupying a building about 60 x 120 ft., four stories, of steel and brick construction, in which the most modern equipment is used throughout.

William Gardam & Son, Inc., expert and general machinists and manufacturers of adjustable multiple spindle drilling machines, adjustable gang drills and sensitive drill presses, announce the removal of their offices and workshop May 1 from 221 Fulton street to 80 to 86 Park place, southwest corner Greenwich street, New York. The new quarters, being more commodious, will provide facilities for doing a much larger business than has heretofore been possible. Their works for the manufacture of their larger and heavier machines are at Arlington, N. J., but all communications should be addressed to the office in New York.

The Arcade Rotary Sand Sifter

The Arcade Mfg. Company, Freeport, Ill., has developed a machine for riddling sand in the foundry as fast as a man can keep it supplied. This machine consists of two wire cloth cylinders 30 in. long, mounted in a heavy revolving frame. The mesh of the inner cylinder, which is 14 in. in diameter, is $\frac{1}{2}$ in., while the 24-in. outer cylinder can be supplied with either No. 4, 5 or 6



A Rotary Sand Sifter for Foundry Use Made by the Arcade Mfg. Company, Freeport, Ill.

mesh as is required, and it is but the work of a moment to change the mesh.

In use the sand is shoveled into the inner cylinder at the far end and both cylinders are rotated by the piston at the opposite end. By a system of lugs and rollers the riddle is jolted four times during each revolution, which breaks the lumps and prevents the sand from clogging the mesh. In this way the sand passes through the sieve as fast as it is thrown in, and as the sieve is tilted slightly the foreign matter passes out through a chute at the end of the machine.

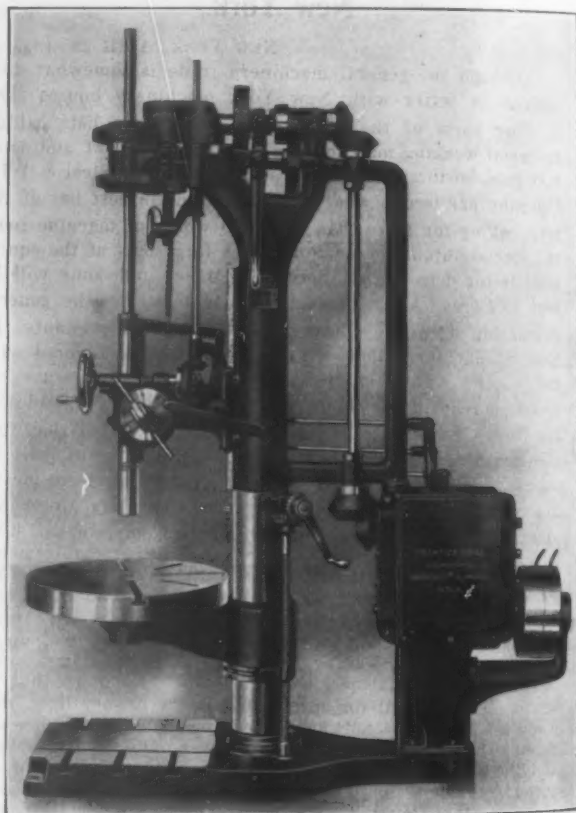
Angle steel is used in the construction of the frame which enables it to withstand hard usage, while at the same time two men can easily move it from place to place. The sifter can be operated either by hand or power. When hand operation is employed two men are generally used, one to shovel the sand into the sifter and the other to turn it, although there is a handle in the outer rim of the sand entrance so that one man can operate it without help, as the bearings are of the roller type and the cylinder revolves easily. The extreme height of the machine is 3 ft. 9 in. and the extreme width 2 ft. 5 in.

The Ziegler-Schryer Mfg. Company, Freeport, Ill., manufacturer of gasoline engines, has begun the construction of a reinforced concrete machine shop building. The plans provide for a large drafting room and superintendent's and administration offices on the second floor. Special attention has been given to the lighting and ventilation of the plant, while sanitary toilet and washrooms have been provided for the workmen. The main floor is arranged for overhead crane service. The heavy machine tools have a thoroughly worked out system of jib cranes, and industrial tracks serve all portions of the shop, so that heavy parts can be handled with the greatest expedition and economy. Many of the machine tools being installed are of special design. The contract provides for the completion of the building in 60 days.

New Prentice Ball Bearing Drill

In bringing out its new 30-in. geared speed change vertical drilling machine, the Prentice Brothers Company, Worcester, Mass., has made no changes in the design except that of equipping the tool with ball bearings throughout. This machine has 15 sets of ball bearings with races of high carbon chromium steel including those for taking the thrust. Experiments have demonstrated that this machine will drill any hole under the same conditions with the expenditure of one-half the power required for the same work where a machine equipped with ordinary bearings is used. It is the intention of the company to make this construction standard throughout its entire line, and at the present time experiments with a ball bearing radial drill are being made.

The back gears are so arranged in this drill that the speed of the spindle can be instantly changed or reversed without stopping the machine by simply operating the back gear lever, which is easily reached from the front of the column. Sixteen spindle speeds ranging from 12 to 300 rev. per min. are provided, as well as



A New 30-In. Drill with Geared Speed Changes and Ball Bearings Built by the Prentice Brothers Company, Worcester, Mass.

four geared feed changes. All of these changes are available without stopping the drill. An improved quick return and stop motion for the drill spindle also forms a part of the equipment.

The following table gives the principal dimensions and specifications of the drill:

Distance from center of spindle to column, inches.....	15 $\frac{1}{4}$
Maximum distance from spindle to base, inches.....	50
Maximum distance from spindle to table, inches.....	37
Vertical adjustment of table, inches.....	13 $\frac{1}{4}$
Vertical traverse of spindle, inches.....	14 $\frac{1}{2}$
Morse taper of spindle hole.....	No. 4
Overall height, inches.....	100
Diameter of spindle, inches.....	1 $\frac{1}{2}$
Diameter of table, inches.....	29
Diameter of driving pulley, inches.....	14
Face width of driving pulley, inches.....	3 $\frac{1}{4}$
Speed of countershaft, revolutions per minute.....	300
Net weight, pounds.....	2,800
Boxed shipping weight, pounds.....	3,600
Capacity of case, cubic feet.....	126

If desired, friction pulleys can be supplied for tapping or a special tapping device can be attached to the spindle.

The Machinery Markets

The event of the week was the appearance in the East of a list from the American Steel & Wire Company calling for more than \$100,000 worth of equipment for several of its plants. The New York trade is filling orders against one large railroad list and two automobile lists. Business is not so brisk in other parts of the country. The demand is irregular in Philadelphia, and there is keen competition for the business in sight. The machine tool demand has fallen off in New England, but there is a good call in that market for other kinds of mechanical equipment. A slight improvement is noted in Cleveland, where there is a fair demand for special machinery and electrical equipment. The foundries in the Cleveland market are busy with automobile castings. The machine tool business is fairly good in Chicago, but the general demand there is dull. Power equipment and quarrying machinery are being sold in the South. The Texas market has a cheerful tone. It is reported from there that there are many indications of a better business. Trade is sporadic in Cincinnati, the chief customers being the automobile builders and the railroads. More activity in the machine tool market is reported from the Pacific Coast, where some dealers claim they have done a better business of late than at any time in the last four years. Some good railroad buying is in sight in the San Francisco market. Business is generally good in Canada, and from all accounts increased buying can be looked for in that quarter.

New York

NEW YORK, April 26, 1911.

Although the general machinery trade is somewhat dull, business is better with New York machinery houses than in other parts of the country, as some large lists calling for metal working machinery are being closed out and some very good business is in sight. The American Steel & Wire Company has issued what is probably the largest list of the year, calling for more than \$100,000 worth of machine tools and special automatic machinery. A large part of the equipment is for delivery at Worcester, Mass., and some will be sent to Corey, Ala. The list was sent out by the general purchasing agent at Cleveland and from all accounts the Eastern machinery houses were the first to be favored with the inquiry. This list is only the forerunner of some extensive purchasing to be done by the subsidiary companies of the United States Steel Corporation. It is stated that further machinery requirements for the Corey plant will be called for in the near future. Some large orders were placed in this territory during the week by the Pope Mfg. Company, Hartford, Conn., and the Saurer Motor Company has been making further inquiries with a view to filling requirements included in its list now out. It is pretty certain that before the week is over the Ontario & Western Railroad will begin closing out its machine tool list, as assurances have been given that some of the purchases have been decided upon. While some of the leading houses are busy bidding against these large specifications, other machinery men are not so active. The demand for special machinery is very light, and manufacturers of woodworking equipment are experiencing a dull period. On the other hand, power plant men are busy, and the New York office of at least one manufacturer of power accessories has enough business on its books to give assurance that April will be its banner month for the year. There is an excellent call for Corliss engines and a large part of this machinery is wanted for replacement. The Standard Oil Company, which is generally a generous buyer of machinery in dull times when advantageous prices can be made, is purchasing a general line of mechanical equipment, chiefly for replacement, and most of its purchasing in this market has been for its large shops at Bayonne, N. J.

A Large Trade School List

Bids will be received May 30 by the Board of Education, Yonkers, N. Y., on a list of machine tools to be delivered to the Saunders Trade School by June 15. The list, which calls for an expenditure of fully \$15,000, follows:

Two 14-in. by 5-ft. lathes, arranged with three-step cone and double back gears in the headstock, complete with regular equipment, including compound rest, power cross feed, quick change gear feed mechanism and countershaft.

Eight 12-in. by 5-ft. engine lathes, arranged with four-step cone, back gears, complete with compound rest, power cross feed, large and small face plates, follow rest, steady rest, countershaft and wrenches, quick change gear feed mechanism.

One 15-in. by 5-ft. engine lathe, arranged with quick change feed, compound rest, three-step cone, double back gear, large and small face plates, steady and follow rests, complete with countershaft.

One 15-in. by 6-ft. engine lathe, arranged with geared head, taper attachment, complete with compound rest, large and small face plates, steady and follow rests.

One 16-in. by 6-ft. engine lathe, arranged with geared head, compound rest, power cross feed, complete with releasing attachment and all regular attachments.

One universal tool grinding machine with countershaft and surface and circular grinding attachments.

One 15-in. shaper with swivel table, power down feed, automatic stop, graduated swivel base, arranged for D. C. motor drive.

One 18-in. shaper, complete with regular equipment, arranged for belt drive, with swivel table vise.

One 12-in. precision sensitive drill, complete.

One twist drill grinder complete, arranged for motor drive, with motor, to grind drills from 1/4-in. to 2 1/4-in., emery wheel 8 1/2 in., provided with guard.

One universal milling machine, constant speed drive, fitted with a 5-hp. motor wired complete with friction clutch, automatic vertical feed, complete with attachments.

One single pulley drive, heavy duty, Universal milling machine, complete with swivel base, center rest, universal chuck, tables for spacing and cutting spirals and No. 22 arbor and automatic feed.

One 28-in. drill press, arranged for motor drive, with gear, back gears, positive power feed, automatic stop, with tapping attachment, compound table and geared revolving table, complete.

One 14-in. combined turret chucking lathe and wire feed screw machine, complete, with three-jawed chuck.

One keyseater with regular equipment and countershaft.

One portable crane.

One motor driven oilstone grinder with AC motor.

One 36-in. band saw, arranged to be driven by individual motor, with guards for both upper and lower wheels.

One hand planer and jointer to plane 16 in. wide, with circular safety head, arranged for motor drive.

One hand planer and jointer to plane 6 in. wide, with circular safety cylinder, complete with countershaft.

Four 11-in. by 4-ft. lathes, with countershaft, complete.

One double forge with down draft hood.

One exhaust fan, direct connected to motor and inlet box, with one 2-hp. AC motor.

One motor blower direct connected to forge.

One 14-in. by 5-ft. engine lathe, complete with compound rest, countershaft, large and small face plates, center rest, tie-bar headstock.

One 14-in. by 5-ft. engine lathe, cone headstock, complete with compound rest, countershaft, large and small face plates, center rest.

Four engine lathes, 14-in. by 5-ft., arranged with quick change feed, complete with compound rest, large and small face plates, center rest and countershaft.

The American Radiator Company, whose main offices are at Chicago, Ill., with New York headquarters at 104 West Forty-second street, has purchased a large tract of land at Forty-ninth street, Bayonne, N. J., between the tracks of the Lehigh Valley Railroad and New York Bay. The company has not as yet made an announcement of its plans, but it is said that it intends to use the property for the erection of a plant which will give it manufacturing facilities at tide-water.

The International Steam Pump Company, through its foreign branch, has obtained a contract to build municipal water works at Buenos Ayres, the estimated cost of which will be \$1,000,000. The company has not decided as yet at which of its plants the pumping equipment will be made, but it is understood that the fulfilling of the contract will entail expenditures in the general market.

The Standard Compress Company, 115 Broadway, New York, has been organized to build cotton compresses. The company controls patents obtained by Charles J. Luce of Niantic, Conn., who is general superintendent of its mechanical department. It is understood that at first the company will have its machines made by contract.

The Lauter Piano Company, Newark, N. J., has plans completed for a large piano manufacturing plant at Sussex avenue and Duryea street, Newark, in which will be installed considerable woodworking machinery, machine tools and special machinery. The plant will consist of two buildings, each 50 x 150 ft. and six stories. The American Concrete Steel Company has the contract for the erection of the structure.

Kops Brothers, corset manufacturers at Twelfth street and Fourth avenue, New York, will receive bids on two 150-kw. and one 150-kw. power units to be installed in a new plant at Sixteenth street and Irving place, New York.

S. Sternau & Co., manufacturers of art metal goods, have

THE MACHINERY MARKETS

let a contract to the Fuller Construction Company, 11 Broadway, New York, for the erection of a 10-story and basement building, 85 x 122 ft., which is to be built at 195 Plymouth street, Brooklyn, N. Y.

The Otto Higel Company, Ltd., Toronto, will soon establish a large plant in Buffalo, N. Y., as its United States branch for the manufacture of its patent piano players. Aluminum is to be used in place of other metals in the manufacture of these players.

The Floss Shade Roller Company, Ogdensburg, N. Y., has let the contract for building a three-story factory to replace a building recently burned. Chas. F. Floss is president, Brooklyn, N. Y.

The American Locomotive Company will build at its Brooks plant, Dunkirk, N. Y., a wheel shop 120 ft. long, to be erected on a portion of the site of the old boiler shop. The remainder of the old boiler shop will be remodeled and used by the machine shop department; the rebuilt shop to be 90 x 400 ft.

Cornell University, Ithaca, N. Y., will soon receive bids for the erection and equipment of a machine shop and carpenter shop, 50 x 169 ft., three stories, with wing, 32 x 45 ft., three stories, to be built in connection with Sibley College.

The Star Electric Company, Binghamton, N. Y., will build a two-story factory, 60 x 90 ft.

The Spirella Company, Meadville, Pa., manufacturer of corsets, will move its plant to Niagara Falls, N. Y., where it has acquired a site of 4 acres on Whirlpool avenue at the north end of the city, and will erect manufacturing buildings which will cost about \$500,000, between the street and the edge of the high bluff overlooking Niagara Gorge. Contract has been let to Westinghouse, Church, Kerr & Co., New York City, for the first group of buildings, comprising the main building and two wings, each 50 x 300 ft., two stories, to cost \$200,000. The company will also erect a branch factory on the Canadian side of the river at Niagara Falls. W. W. Kinkaid is president of the Company, and J. H. Pardee, treasurer.

The Kitchenette Company has been incorporated at Buffalo, N. Y., with a capital stock of \$25,000, to manufacture household articles and utensils. The incorporators include Frank A. Converse and Philip B. Cary, Buffalo, and Eugene Cary, Niagara Falls. The company has established its factory at North Tonawanda, N. Y., temporarily, but will soon remove to Buffalo. Offices are at 728 Ellicott Square Building.

The De Carie Incinerator Company, Minneapolis, Minn., has received the contract for the construction of the rubbish incinerating plant for the city of Rochester, which will cost \$83,000.

The Ferrand Mfg. Company has been incorporated at Gardenville, N. Y., near Buffalo, with a capital stock of \$50,000, and purchased the Schoepflin Mills, with water power rights for a flour and feed mill. The mill will be enlarged and equipped with up-to-date machinery. Augustus B. Ferrand, president.

The Peerless Silk Finishing Company, Nyack, N. Y., has completed plans for a new silk finishing mill, 90 x 90 ft., three stories, which it will erect at once.

The Frontier Elevator & Milling Company, Buffalo, N. Y., will build a reinforced concrete elevator tower and equip it at a cost of \$20,000.

Chicago

CHICAGO, ILL., April 25, 1911.

A fair amount of machine tool business continues to come forward as the season advances, but it is plainly evident that unless something very unusual occurs the year's business is going to fall far short of normal. Many machine tool houses are complaining about sales, and, without exception, business is falling behind the records made by these firms in years. Collections are slow, and the matter of credits is receiving rigid scrutiny since the recent failures in the machinery district. A spirit of uneasiness seems to prevail, and this is only natural when a review of the past six months shows that machinery supply houses have been doing less than 60 per cent. of what they have come to call a normal volume of business. A disposition on the part of buyers to delay actual purchases until after the close of their fiscal year is plainly evident, and, while new lists are expected, little actual buying is anticipated until July 1.

The Illinois Central bids on recently issued lists were closed April 21. The Santa Fe will place its order by the middle of next month for delivery July 1.

Among purchases closed the Rock Island Railroad list amounting to about \$10,000 is the largest. This business was fairly well split, several local dealers sharing it.

McDowell, Stocker & Co.'s business is now being conducted by a receiver, pending a reorganization. Negotia-

tions have proceeded to such a point that the reorganization seems assured, and it is expected to be accomplished soon.

The Channon Emery Stone Company, Quincy, Ill., has near completion a new building, 50 x 125 ft., two stories, the first floor of which will be used as a cleaning room and the second floor as a mounting room.

The Kurtz Action Company, Rockford, Ill., manufacturer of piano actions, has increased its capital stock from \$100,000 to \$400,000, and is having plans prepared for extensive additions.

James W. Love, Joliet, Ill., carpenter and general jobber, is erecting a three-story fireproof factory building, which is to be arranged especially for shop and light factory purposes. The building will be 50 x 66 ft., and each floor will be divided longitudinally in the center, making six shops, 25 x 66 ft. One of the shops will be occupied by James W. Love, who will move the equipment he now has in his present location, and will also install a new planer. Whether a heating and power plant will be installed depends upon the requirements of future tenants.

The National Machine Company, Milwaukee, Wis., is having plans prepared for a new machine shop, 55 x 100 ft., two stories, of brick and steel construction. The building will also have a basement 14 x 35 ft., which will contain the heating plant and lavatories. The first floor will be 16 ft. in the clear and equipped with a 5-ton traveling crane, and the second floor will be 12 ft. in the clear. An electric elevator will be installed later.

Among the different manufacturing industries being located at Marinette, Wis., is the Kreiter Mfg. Company, which is being moved from Milwaukee; the Marinette Wood Working Company and the Lignum Chemical Company. The Kreiter Company manufactures pianos and has taken over an existing plant, which it is equipping with the necessary machinery.

The Minn Billiard Company, Milwaukee, Wis., has plans completed for the erection of a new factory building, 120 x 157 ft., three stories. Considerable woodworking machinery will be purchased.

The National Brake & Electric Company, Milwaukee, Wis., has plans prepared for a test shop 60 x 120 ft., to be of fireproof construction. The building will be used for testing gas engines and gas driven locomotives manufactured by the company. The company just completed an addition to its machine shop at a cost of \$150,000.

Bonds in the amount of \$46,000 have been voted by Longmont, Colo., for the construction of an electric light plant.

The Northwestern Steam Boiler & Mfg. Company, Duluth, Minn., has been purchased at receiver's sale by Michael S. Bright of that city, who advises that he has not decided upon plans for the future.

The Rice & Dayton Mfg. Company, Cedar Falls, Iowa, automobile supplies, is having erected a factory building 64 x 100 ft., of concrete construction. The building will be three stories and will be equipped with an electric elevator.

The Reliance Brick & Tile Company, Belle Plaine, Iowa, has been incorporated, with an authorized capital stock of \$400,000. The company has purchased 100 acres of land on the Chicago & Northwestern Railroad, containing extensive clay deposits, and will erect a brick and tile plant covering 5 acres, with a daily capacity of 100,000 bricks. Contract for the first unit of the plant has been let to the Nelson Construction Company, Miles City, Iowa, and work will be commenced at once. Twelve kilns will ultimately be installed. The company will operate its own electric light and power plant. The officers of the company are W. R. Law, president; P. W. Smith, vice-president; H. E. Law, treasurer; R. A. Law, secretary, all Waterloo capitalists.

Fred J. Cross is constructing on the Wapsipinicon River, at Central City, Iowa, a dam and power station of about 500 hp. capacity. Mr. Cross has franchises to light the towns of Central City, Alburnett, Center Point, Urbana and Walker.

The City Council of Mandan, N. D., has called a special election to be held on April 24, for the purpose of voting a bond issue of \$80,000 to be used for the construction of a water works system.

The Cottagewood Water & Light Company, Deephaven, Minn., has been granted a franchise to install a water works system. The company will also remodel its light plant.

New England

BOSTON, MASS., April 25, 1911.

The demand for machine tools has decreased rather than increased during the past fortnight. The manufacturers, with a few exceptions, agree with the dealers in this, which indicates that this territory is no exception to the rule throughout the country. Manufacturing machinery—that is to say, tools used in producing articles other than machin-

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ery—are selling in fairly good volume, however. Apparently the nearer a product is to the consumer the better the trade condition in the metal lines. The tool steel people find that their market corresponds closely to that of the machine tool trade. The labor bureau conducted by the Boston branch, National Metal Trades Association, reports a slightly increasing demand for labor. The month of May is usually one of the largest of the year. The weather has been unusually cold and dreary, which always has a certain amount of influence on buying, and some degree of improvement seems almost inevitable.

The Southington Mfg. Company, Southington, Conn., manufacturer of hardware, has purchased the business of the W. A. Ives Mfg. Company, Wallingford, Conn., manufacturer of bit braces, and will remove the factory to Southington. The business will occupy an addition to the building of the Southington Industrial Improvement Company, one 30 x 33 ft., two stories, the other 30 x 35 ft., one story. The company states that it will be in the market for all the machine tools required in the manufacture of braces. A complete line of screwdrivers and small tools is manufactured, and the bit brace department will add to the scope of the industry.

The Yale & Towne Mfg. Company, Stamford, Conn., manufacturer of hardware, is planning a new brass foundry, but the plans are not advanced to the point of details.

The Lapointe Machine Tool Company, Hudson, Mass., states that there is no truth in the statement published in the daily papers that the business would be removed to Middletown, Conn. The industry will continue at its present site, where it is housed in large modern buildings.

The Alderhurst Iron Company, New Haven, Conn., successor to the Yale Safe & Iron Company, manufacturer of architectural iron work, has moved to its new plant.

The Waterbury Machine Company, Waterbury, Conn., manufacturer of wire machinery, has been formally merged into the Waterbury Farrel Foundry & Machine Company, which has controlled it for several years. The formal announcement is that the Waterbury Machine Company's plant has been leased to the Waterbury Farrel Foundry & Machine Company, which hereafter will render invoices and receive payment for orders for the product. The change will not affect the personnel of the business.

The Central Autogenous Welding Company, Worcester, Mass., has reincorporated with a Massachusetts charter and capital stock of \$20,000. John A. Braithwaite is the president and Walter Winton treasurer and clerk. The company has recently begun the manufacture of a ball bearing polishing and buffing machine, in addition to its business of autogenous welding, and requires additional capital to extend the industry.

The American Optical Company, Southbridge, Mass., will establish a die sinking shop at Providence, R. I. The company does a very large business and uses many dies and has found the supply of skilled die sinkers insufficient in Southbridge.

The Billings & Spencer Company, Hartford, Conn., manufacturer of drop forgings and small tools, will build at its Hartford plant an addition 40 x 113 ft., three stories, and an additional story to a building 40 x 70 ft.

Philadelphia

PHILADELPHIA, PA., April 24, 1911.

The demand still shows considerable irregularity. The improvement recently reported has been of rather short duration, the current week's business having hardly been up to that of the previous week. Inquiries have again been less pronounced. Transactions have been largely confined to single tools, and buyers appear to be in no particular haste to close for tools under negotiation. There is practically no fresh railroad demand, and some of the inquiries which have been before the trade for some little time are reported as still being unclosed. Practically all of the business in the way of a general inquiry that comes before the trade is subject to keen competition, and reports of concessions and special considerations in order to effect a sale are frequently heard. Manufacturers are for the most part operating plants at a reduced capacity, particularly those making the standard types of tools; special tool makers are, however, somewhat more actively engaged, but in few cases are plants actually busy. The local locomotive builder is less actively engaged and will, it is understood, make considerable reduction in its working force. Second-hand machinery merchants report business as rather dull, reflecting the general condition of the trade. While manufacturers of various classes of products, other than large machinery users, are making additions to their plants and general factory buildings are being erected, there is little ahead that would indicate any heavy machine tool buying.

In the majority of these cases small power plants cover the bulk of the requirements of interest to the machine tool trade, although occasionally the installation of elevators and, less frequently, overhead traveling cranes are being considered. The foundry trade is not particularly active, although the demand for steel castings is a trifle better, but by no means up to normal.

The Williamson Bros. Company, in connection with announced plans for the extensions of its plant, has awarded a contract for a new erecting shop, 70 x 270 ft., and blacksmith shop, 40 x 50 ft., of brick and steel construction, at Edgemont and Aramingo streets, to George Kessler, Drexel Building. One and probably two 15-ton electric traveling cranes are to be installed.

The Haney-White Company has awarded a contract for the rebuilding of a portion of its plant recently destroyed by fire, which will be altered into a modern garage. A three-story addition, 50 x 75 ft., will be raised on the present building, and a one-story building, 50 x 150 ft., added. An automobile elevator and a large tank for fire protection are to be installed. When completed the garage is to have a capacity of accommodating some 75 automobiles.

The Union Saw Company, Frackville, Pa., states that the reorganization of its company has been completed, and that it is now making some changes to its machinery and installing new tempering and hardening furnaces, and will shortly be operating its plant full handed.

The American Pulley Company reports a slight increase in the volume of business coming in, both from its foreign and domestic customers. The demand has been largely for its standard types of pulleys, heavy shipments of which have been made for export to Switzerland, England, Holland and South America. Shipments in carload lots have also been made to customers in various parts of this country.

H. S. Kerbaugh, Inc., has been awarded a contract by the Baltimore & Ohio Railroad for the construction of a double track tunnel through the Allegheny Mountains in the vicinity of Sand Patch, Somerset County, Pa., on which work will be started at once.

The Electric Storage Battery Company has awarded a contract for the erection of a six-story factory building, 115 x 300 ft., at Nineteenth street and Allegheny avenue, to John G. Brown of this city. The building is to be of concrete construction. No information as to the nature of the equipment required is available.

The Nicetown Plate Washer Company, Nicetown, Philadelphia, has installed new plate and alligator shears and has purchased a new 26-in. roll lathe. Its facilities for the manufacture of washers, as well as refined iron bars, have been considerably increased. In addition to turning its own rolls, it now does roll turning for the trade.

The City Council of Bridgeton, N. J., at a recent meeting, passed an ordinance providing for the issuing of bonds amounting to \$75,000, for the installation of a new water system, pumping station and filtration plant.

Benjamin Friedenwald, trading as Friedenwald Brothers, Baltimore, Md., is about to retire from the business of manufacturing automobile parts and has arranged for the disposal of his entire equipment, consisting of 44 engine lathes, sizes 13 to 72 in., and one each 72-in. and 36-in. planers, a Fostick No. 2 floor boring and milling machine, and an assorted line of radial drills, drill presses, shapers and three large universal milling machines. The sale is under the direction of Mr. Campbell at the plant in Baltimore, Md.

Indianapolis

INDIANAPOLIS, IND., April 25, 1911.

Hetherington & Berner, Indianapolis, Ind., engineers, have under construction a new plant which will cover about 4 acres. The plant will be of fireproof construction. The company will enlarge its line of manufacture, and in addition to its specialty of asphalt paving plants and machinery will manufacture other kinds of contractors' machinery, including concrete mixers, road rollers, steam shovels, &c. The company will also extend its operations in steel construction work.

The Smith Agricultural Chemical Company, Columbus, Ohio, will erect a large fertilizer plant at Indianapolis, Ind. A site has been secured along the right of way of the Vandalia Railroad and more than 7 acres of steel and concrete buildings will be erected.

The W. R. Clark Mfg. Company, Muncie, Ind., has filed articles of incorporation with \$30,000 capital stock. The company will manufacture safety cranks for automobiles, gasoline and other explosive engines. Plans regarding the erection of a factory have not been decided upon, but it is quite probable that a factory will be built in Muncie.

The business of the T. W. Warner Company, Muncie, Ind., manufacturer of automobile parts, has been incorpo-

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rated with \$100,000 capital stock. The company has awarded contracts for the erection of factory buildings at Toledo, Ohio, at a cost of \$100,000.

The Knott Mfg. Company, Fort Wayne, Ind., recently incorporated with \$15,000 capital stock, has leased a plant located on the Nickel Plate tracks in that city, which it is equipping with the latest improved machinery, to be motor driven. The company will manufacture closet tanks and seats, which will embody new and practical ideas.

The F. & N. Lawn Mower Company, Richmond, Ind., has under consideration the erection of a new factory building, plans for which have not yet been determined upon.

Allen & Price, Washington, Ind., who have a plant in course of erection at Gonzales, Texas, are in the market for a combined punch and shear, drill press, pneumatic riveter, blacksmithing outfit, saw and electric motor, and will place the order within the next 30 days.

The Merchants and Manufacturers' Association of New Albany, Ind., has been organized for the purpose of protecting the interests of shippers there. The iron trade is well represented in the membership, Henry Terstegge of the O. K. Stove & Range Company being one of the officers.

The S. J. Gardner Foundry & Machine Company, New Albany, Ind., has filed articles of incorporation with \$50,000 capital stock, and the following incorporators: S. J. Gardner, Frank S. Sisloff and Margaret C. Gardner. The business has been operated heretofore by S. J. Gardner individually, but recently some improvements have been made and the business enlarged. A sheet iron shop and a foundry building have been erected, and a considerable amount of new equipment installed. A cupola manufactured by the S. Obermayer Company has been put in. The company is not in the market for any additional machinery.

Cleveland

CLEVELAND, OHIO, April 25, 1911.

While the local machine tool and machinery market continues quiet some of the dealers report a slight improvement during the week. Orders are still nearly all for single tools. New inquiries are also small, the largest that came out during the week being for six tools. While business did not develop during April, as many had expected, the month will show a little improvement over March. The rubber industry in Akron is bringing a fair volume of business at present in machinery for making molds for automobile tires. The demand for heavy handling machinery continues light. A local maker of bolt and nut machinery reports a fair demand for special machinery in that line. The demand for electrical equipment for traction companies shows a little more activity. Mining machinery is quiet. In the foundry trade orders are generally light, but some foundries that make a specialty of automobile castings now have all the work that they can do.

Specifications for the new power house to be built by the Northern Ohio Traction & Light Company at Cuyahoga Falls, Ohio, are expected to be out this week. Plans are being prepared by the Cleveland Construction Company.

The Cleveland, Painesville & Eastern Railroad has an inquiry out for two 1500-kw. turbines, switchboard and rotary for substation. The new equipment will be used for enlarging the company's power station at Willoughby, Ohio.

About 100 machine tools will be required for the new west technical high school in Cleveland, the construction of which has just been started. It is expected that the list will be out early in the summer. While it will not be the largest, the school authorities plan to have the best equipped technical high school in the country. There will be three pattern shops—38 x 40 ft. for pattern and cabinet work, each equipped with six lathes; a foundry, 40 x 48 ft.; two machine shops, one 43 x 56 ft. and one 48 x 52 ft.; a forge shop, 40 x 63 ft., and a pottery. The forge shop will be equipped with 31 forges. A power plant will be built independent of the main building, specifications for the equipment of which will be out shortly.

The Perfection Machine & Mfg. Company has been incorporated with a capital stock of \$25,000, to manufacture a gas heating radiator. The company will be located at 5346 Hamilton avenue. The officers are A. H. Davies, president; W. J. Hurley, vice-president, and N. W. Thomas, secretary and treasurer.

The plant of the Orrville Pump & Furnace Company, Orrville, Ohio, consisting of a foundry, pattern and machine shop and power house, will be sold at bankruptcy sale April 29.

The Board of Education, Toledo, Ohio, will receive bids May 15 for an electric light and power system, interior telephone system and other equipment for the Scott and Waite high schools in that city, which will cost approximately \$400,000 each. Plans and specifications can be secured from G. L. McKesson, director of schools.

The Advance Machine Company, Toledo, Ohio, will enlarge its plant by the erection of an addition, 40 x 75 ft.

The Realty Rubber Company, Massillon, Ohio, which recently increased its capital stock to \$100,000, is planning the erection of a new plant in order to largely increase its present capacity. E. T. Rickert is president and manager.

The Board of Trustees of Public Affairs, Lakewood, Ohio, will receive bids May 9 for a steel water tower.

The Bremen Mfg. Company, Bremen, Ohio, which will manufacture a new pumping engine, has been organized with the following officers: President, W. S. Turner; vice-president, C. C. Hoskins; secretary and treasurer, H. M. Sheldhamer; general manager, H. E. Young.

The National Automatic Machinery Company, Wellston, Ohio, has been incorporated with a capital stock of \$100,000, by J. C. Clutts, W. H. Kelly, J. H. Brown, J. C. Gooding, Geo. C. Sellers and S. M. Kelley.

The Cleveland Aluminum Casting Company, Cleveland, has been incorporated with a capital stock of \$10,000, by M. J. Hancox and others. The company will be located at the plant of the Industrial Pattern & Bronze Company on East Sixty-seventh street.

The Minster Machine Company, Minster, Ohio, maker of power transmission machinery, &c., will enlarge its plant by the erection of two buildings, one 70 x 180 ft., to be used for manufacturing and assembling, and the other 50 x 70 ft. to be used as a stockroom.

The Republic Rubber Company, Youngstown, Ohio, manufacturer of mechanical rubber goods, rubber hose for water and air service, automobile tires, &c., will in the latter part of May complete its new machine shop, and is in the market for a line of woodworking machinery and machine tools. Complete information can be furnished by the general manager. The building under construction is 72 x 136 ft., and fireproof. It contains a balcony for the storage of patterns. The company is busy in its various operating departments, considerable business having been booked for Western shipment.

The Sanitary Table & Mfg. Company, Cleveland, has been incorporated to manufacture kitchen tables with porcelain enameled steel tops. Calvin A. Judson is president; B. J. Doyle, vice-president, and James T. Harding, secretary and treasurer. The company has offices at 620 Society for Savings Building.

Cincinnati

CINCINNATI, OHIO, April 25, 1911.

As yet neither the railroads nor the automobile manufacturers have shown any signs of being heavy purchasers of machine tools at any time in the near future. There is, however, some sporadic buying on the part of both, and it is generally believed that the automobile trade will show considerable improvement during the summer season. A prominent local banker calls attention to the fact that money is plentiful, and a little confidence is all that is needed to start a healthy business boom.

Small motors and dynamos are in excellent demand, and gas engines are also good sellers. Second-hand equipment of all kinds is reported as showing some improvement. The jobbing foundries continue operating on hand-to-mouth orders and some weeks are working on full time, generally followed by a correspondingly dull period when they have to close down.

Several Cincinnati machine tool builders sent experts to Chicago April 24 for the purpose of assisting the Marshall & Huschart Machinery Company of that city in demonstrating the different tools of their manufacture to the graduating class of the Ohio State University.

The Union Central Life Insurance Company has definitely decided to erect a large office building in Cincinnati. Tentative plans call for a structure of over 30 stories. The architect has not yet been selected.

The Peck, Anderson & Peck Company, Cincinnati, heating and ventilating contractor, has leased the three-and-one-half-story building at Court and Sycamore streets, and on June 1 will move its metal working plant from Broadway and Court to the new location. The new plant will be fitted up with modern machinery and the firm's present output will be more than doubled.

The R. K. LeBlond Machine Tool Company, Cincinnati, has finished the new addition to its plant in East End and is now installing the necessary machinery.

The Kelley-Koett Mfg. Company, Covington, Ky., has made up plans for building a factory that will be used for the manufacture of X-ray apparatus.

The Riley Shoe Mfg. Company, Columbus, Ohio, has prepared plans for an addition to its factory that will more than double its present capacity.

Swift & Co., packers, Chicago, are having plans prepared

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for a large cold storage plant to be erected in Cincinnati, the estimated cost of which will be over \$100,000.

It is rumored that the Louisville & Nashville Railroad Company is having plans made up for large car shops to be erected near Frankfort, Ky.

The Dayton, Lebanon & Cincinnati Railroad Company has definitely decided on constructing a large concrete freight station at Dayton, Ohio.

Architect Henry N. Hooper, Cincinnati, has completed plans for the concrete factory, recently mentioned, to be constructed in Carthage, Cincinnati suburb, by the Union Thread Company.

The American Tool Works Company, Cincinnati, has leased the building at 427 and 429 New street, which will be used for warehouse purposes.

Detroit

DETROIT, MICH., April 24, 1911.

Conditions are quite satisfactory, both in this city and throughout the State, for manufacturing interests. The automobile trade has been particularly active, and the volume of orders continues far in excess of the output. Shipments this month will not reach the total March attained. The big truck companies, however, bid fair to exceed the March output. The auto accessories firms are in a very prosperous state, which would naturally be true, inasmuch as the motor car companies are running to their limit. Several concerns are just entering profitable foreign fields, and are doing well in point of orders. Building operations are going well, with several big propositions in view. An immense auditorium is planned by prominent business men and will undoubtedly be put through. The nature of the building will call for considerable structural steel work.

The Michigan United Railways has put through an important deal, which will give this city a 10-hour direct service to Chicago. It has taken over the Kalamazoo, Lake Shore & Chicago Railway and has made traffic arrangements with the Detroit United Railways, welding the link between this city and Chicago. The Kalamazoo, Lake Shore & Chicago Railway is a steam road, and will be electrified as soon as possible. From the terminal at Benton Harbor the Michigan United Railways will run passenger boats to Chicago. Much needed equipment is to be purchased in addition to the new boats.

The Boyer-Campbell Company, machinist, has let the contract for the erection of a six-story factory building in the center of the city. This is to enable the company to care for its crowded condition.

A large glass cutting factory, at present located at Cleveland, Ohio, is planning to move its plant to Trenton, Mich. The one thing wanted is to secure a site large enough for the erection of a plant large enough to keep up with the company's output. The affairs are in the hands of the Trenton Business Men's Association.

The Michigan Carton Company, Battle Creek, Mich., which recently increased its capital stock from \$250,000 to \$500,000, will begin the erection of a one machine box board mill. The plant will be large and modern, and will be an important addition to Battle Creek's paper industries.

The Kerwin Machine Company, Detroit, Mich., has filed articles of incorporation. The company has a capital stock of \$100,000.

A new carriage concern has been organized at Holly, Mich. The new company, which is known as the Carter Dump Wagon & Mfg. Company, has filed articles of association with a capital stock of \$100,000.

The East Jordan Cooperage Company, at present incorporated under the laws of Ohio, has filed like articles with the Secretary of State for the establishment of a plant at East Jordan, Mich. The company has a capital stock of \$50,000.

On May 5 the city of Marquette, Mich., will vote on the proposition of bonding the city for \$75,000, to cover the cost of a modern water works plant.

The Tilden Saw Company of this city and the Campbell Mfg. Company of Wyandotte, Mich., have formed a consolidation, whereby the two are to be merged under the name of the Tilden Saw & Mfg. Company. The machinery of the Detroit plant will be removed to Wyandotte at once, where the company will occupy a much larger plant.

The Casey Mfg. Company, machinist, has filed articles of incorporation. It will start with a capital stock of \$20,000. J. P. Casey and Thomas A. Leary are the principal stockholders.

The Motor Wagon Company is the name of a new automobile truck concern organized in this city last week. The company is well financed, the capital stock being \$150,000, and will make light delivery trucks.

The National Lighting System Company was organized

this week with a capital stock of \$10,000. The company's product will be electrical installation parts. Maurice L. Chertak and Abraham Green are the organizers.

The Detroit Motor Cycle Company has incorporated with \$50,000 capital stock and will make a motorcycle with many new features. W. J. Nagle and W. J. Connelly are interested largely.

The Davies Mfg. Company is the second of two large companies filing articles of incorporation this week. The company has plenty of working capital, to the amount of \$150,000, and will commence operations as soon as the plant and equipment can be completed.

The Brady-Nagle Mfg. Company is the name of a small concern with a capital stock of \$11,000 incorporated this week. The company is backed by parties of good standing, and it is learned that the company will expand as soon as conditions warrant.

The Excelsior Foundry Company, Bay City, Mich., whose plant was completely destroyed by fire last week, will rebuild it as soon as possible.

The Cummer-Diggins Company, Cadillac, Mich., has announced plans for the erection of a two-story lath and shingle mill, 50 x 60 ft. The building will be of modern steel construction.

The Empire Portland Cement Company, Portsmouth, Ohio, which will build a big plant at Menominee, Mich., has announced plans for the construction of a main plant, 360 x 400 ft., and four kilns.

The Three Oaks Creamery Company, Three Oaks, Mich., lost its plant, including all machinery, by fire last week. The company states that it will rebuild and re-equip immediately. John Jacobson owns the plant.

The Newago Engineering Company, Newago, Mich., manufacturer of special machinery for cement plants, has begun the erection of a large addition. The building will be a steel and cement structure, three stories, 250 x 450 ft. W. J. Bell is president and general manager.

Benton Harbor will again vote on the \$100,000 bonding proposition for the building of a new electric light plant. The question was lost in the April election by the narrow margin of two votes.

The Skalla Furniture Company, Niles, Mich., suffered a severe loss in a fire that destroyed a large portion of the plant. It is understood that the company will rebuild the burned portion.

St. Louis

ST. LOUIS, MO., April 24, 1911.

Business in the machine tool line has been quiet. Some fair business is pending, but few orders of any consequence have come out. The manufacturers of shoe machinery have been quite busy, as have the several manufacturers of electric motors and similar apparatus.

The National Lead Company is making extensive additions to its St. Louis lead and oil plant on Manchester avenue, two large concrete buildings being in progress of erection.

The Scullin-Gallagher Iron & Steel Company contemplates some extensions.

The Bignall & Keeler Mfg. Company, Edwardsville, Ill., manufacturer of pipe machines, is very busy.

The Aluminum Company of America has some good sized improvements under way at its plant in East St. Louis.

The Anheuser Busch Brewing Association is proceeding with the construction of its new wagon factory and orders for some machinery have been placed.

The Ideal Vending Machine Mfg. Company, St. Louis, has been incorporated, with a capital stock, fully paid, of \$10,000. The incorporators are John Ford, J. L. Scheuble and J. G. Beckmann. The company will manufacture vending machines.

The Louis Werner Sawmill Company, St. Louis, has increased its capital stock from \$150,000 to \$600,000.

The Beck Automatic Electric Safety & Signal Switch Company, St. Louis, has been incorporated, with a capital stock of \$50,000. The incorporators are Charles Beck, Arthur Beck and Morris Tucker. The company will manufacture safety appliances, &c.

The mill and elevator at Greenfield, Mo., were destroyed by fire April 5, causing a loss of \$115,000, fully covered by insurance.

Cowell & Vermillion will erect at Fair Play, Mo., a large broom factory in the near future.

James Gray, Red Bird, Mo., will erect at St. James a flouring mill of 50 barrels daily capacity. Work on the mill will begin at once.

The Dupont & de Nemours Powder Company is erecting at Scotland Springs, near Joplin, Mo., the buildings for an extensive powder manufacturing plant. Two of the buildings are already started and a Missouri Pacific spur switch is under way, fully a mile of track being nearly completed. It is

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reported that the Dupont Company will proceed with building until upward of 70 structures are completed, which includes provision for a water works system. The grounds owned by the company have their south boundary near Scotland and extend for 2 miles. They also own an extensive territory east and west.

Canterbury Bros., Higginsville, Mo., will erect a 10-ton ice plant at that place. Work will begin at once.

A. Robertson, Neelyville, Mo., is erecting a grist mill which will be equipped with the latest machinery.

The bonds for the new \$35,000 municipal electric light plant for Monett, Mo., have been placed in St. Louis and work on the plant will begin at once.

The Bituminous Gas Products Company, Kansas City, Mo., has been incorporated, with a capital stock of \$50,000. The incorporators are W. Clifton Hogan, L. E. Jones, W. A. Shoemaker and others.

The Eldorado Milling & Grain Company, Eldorado Springs, Mo., has been incorporated, with a capital stock of \$10,000. The incorporators are W. H. Anthony, M. A. Anthony, T. E. Eddlemore and others.

The Star Brass Works Company, Kansas City, Mo., has increased its capital stock from \$10,000 to \$30,000.

The Martin Machinery Company, Joplin, Mo., is preparing to erect new shops and offices, but advises that plans have not been definitely decided upon.

Waterville, Kan., has estimates prepared for the construction of a \$30,000 light plant and water works system.

The city of Waterloo, Neb., is considering the establishment of a \$12,000 water works system.

Homer, Neb., has under consideration the installation of a water works system.

Bids will be opened by Chappell, Neb., on May 8, for bonds, the proceeds of which are to be used for the construction of electric light plant and water works system.

The Oklahoma Railway Company, Oklahoma City, Okla., is making extensive improvements, including the erection of repair shops, 100 x 180 ft., new train sheds and the installation of new equipment in its power house.

The Acheson Water Elevator Company, Salt Lake City, Utah, has been incorporated, with \$100,000 capital stock, to manufacture a water elevator for irrigation projects invented by E. V. K. Acheson. The company is having the elevator manufactured by a local foundry at present, but later on expects to erect a factory, a site for which has not yet been selected.

The South

LOUISVILLE, KY., April 25, 1911.

General conditions in this market remain good, machinery manufacturers and dealers doing a fair business. The local trade is dull, but out in the State and in Southern territory prospects are bright. The demand for machine tools is reported to be almost nil, but power equipment, quarry machinery and contractors' tools are selling well.

Manufacturers of agricultural implements in Kentucky and Tennessee are reported to be more active than any other class of iron consumers. Plants are running to capacity, and in several cases it will be necessary in a comparatively short time to prepare for enlargements. A big plow manufacturing plant at Louisville, which was only recently put in operation, is already crowded for room in some departments, it is stated.

Installation of equipment will be undertaken at once by the Standard Marble Company, Knoxville, Tenn., which has been incorporated, with \$500,000 capital stock, for the development of large deposits of marble 2 miles east of Knoxville. J. W. Agey, S. H. Bellow, H. C. Brandau, A. A. Schmid and A. Y. Burrows are the incorporators of the company.

W. Hume Logan, president of the Dow Wire & Iron Works, has been elected president of the Employers' Association of Louisville. Henry Vogt, president of the Henry Vogt Machine Company, has been chosen second vice-president of the organization.

The American Blower Company, Detroit, Mich., has secured contracts for the installation of its Sirocco fan system in the Tyler Hotel, the East Broadway school building and the First Christian Church, important structures now being completed in Louisville.

The Alvey-Ferguson Company, Louisville, manufacturer of conveying machinery, now located at Floyd and G streets, announces that it will move its plant to Cincinnati. Details regarding the removal have not as yet been decided. The company has a capital stock of \$50,000 and is in excellent condition, it is stated. The reason for the decision to move, it is understood, has to do with the present system of taxation in Kentucky.

Wood, Stubbs & Co., Louisville, have filed plans for the

erection of a warehouse at Fourteenth and Walnut streets. A freight elevator of considerable capacity will be installed.

The Bristol, Tenn., Traction Company, which has recently been organized, and which has purchased the property of the Bristol Belt Line Railway, is pushing plans for betterments and will expend about \$100,000. Fred Dulaney is vice-president and general manager of the company.

Herren & Cundiff are planning the erection of an electric light plant at Liberty, Ky.

The Kentucky Distillers & Warehouse Company, Louisville, has announced plans for the erection of a distillery plant, with a capacity of 1000 bushels of grain a day, at Nicholasville, Ky.

A bond issue of \$85,000, for the purpose of providing a water works system, will be voted on by Madisonville, Ky., in the near future. It is understood that the issue will be approved without opposition.

The Elkhorn Consolidated Coal & Coke Company, Hellier, Ky., is completing the equipment of a coking plant, a 150-hp. engine and crushing equipment having been purchased. The company is building 50 beehive coke ovens and later will add an equal number. Fon Rogers, Pikeville, Ky., is president of the company.

The Wilhoit Consolidated Coal & Coke Company, Pineville, Ky., is building a railroad spur into its coal lands and will begin the development of its property at once. It is now inquiring for prices on an engine, a boiler and other power equipment. White L. Moss, Pineville, is secretary of the company, which has a capital stock of \$50,000.

The Sunset Coal Company, Madisonville, Ky., is planning the installation of a 150-hp. boiler. The equipment is not needed until September 1. W. R. Lynn is general manager of the company.

The plant of the Lancaster, Ky., Electric Light Company was destroyed by fire April 20, the loss being total. Alex. Walker, the principal stockholder of the company, has announced that the plant will be rebuilt at once. An expenditure of about \$10,000 will be required.

Manufacturers of quarry equipment report that plans are understood to be on foot looking to the organization of a building stone corporation to take over all of the quarries in the Indiana obolitic limestone district, including those near Bedford and Bloomington. Those interested in the Indiana Quarries Company are reported to have originated the plan.

Newport, Tenn., will vote on the question of issuing \$50,000 of water works bonds April 29. It is assured that the issue will be approved.

A bill has been introduced in the Tennessee Legislature authorizing Clinton, Tenn., to issue bonds for the purpose of purchasing an electric light plant.

The Champion Lumber Company is reported to have made plans to enlarge the capacity of its mill at Crestwood, Tenn., by the installation of new power and woodworking machinery.

The State Senate of Tennessee has approved a bill authorizing the city of Memphis to issue bonds for the construction of an electric light plant. The bill has yet to pass the House.

Kenton, Tenn., has been given authority by the State Legislature to issue bonds for the construction of a water works system.

Bids are to be received May 5 by the city of Gallatin, Tenn., on equipment which is to be installed in the municipal electric light plant. A Corliss engine, two 100-kw. dynamos, &c., will be required. Address E. L. Anderson, chairman Water and Light Commission.

A bond issue of \$25,000 has been voted at Manchester, Tenn., for the construction of water works and electric light plant.

The Maryville Foundry, Maryville, Tenn., has been succeeded by the Furnace Equipment Company, of which P. McNaughton is president. It makes a specialty of a grate bar, sales of which are handled through the McNaughton Grate Bar Company, Atlanta.

The Vesta Gas Range & Mfg. Company has been incorporated at Chattanooga, Tenn., with \$100,000 capital stock, by M. H. Coffey, Theodore Ringwald, J. A. Hill and others.

The Cherokee Commission Company, Bristol, Colo., will erect an elevator and warehouse at Memphis, Tenn. R. S. Green is manager of the company at Memphis.

A contract has been awarded for the erection of a building to be used by the Greenwood Advertising Company. Knoxville, Tenn., in the manufacture of metal signs. The structure will be three stories and will cost \$20,000.

The International Harrow & Cultivator Company is beginning operations at Birmingham, Ala. It has a capital stock of \$500,000 and has purchased the plant of the North Birmingham Forge Company. George R. Neal is president and general manager of the company and Robert B. Johnson is secretary.

The Ferrans Machine Works, Ltd., has been incorporated at New Orleans, La. It has a capital stock of \$25,000.

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Charles Ferrans is president and Lewis B. Giraud is secretary of the concern.

The Atlantic Coast Line is reported to have made plans for the construction of a \$250,000 creosoting plant at North Gainesville, Fla.

Articles of incorporation have been filed by the Lafourche Boiler & Sheet Iron Works, Thibodaux, La. The capital stock of the company is \$10,000. Theophile Dupre is president.

The Southern Equipment Company, North Birmingham, Ala., is inquiring for prices on second-hand machine tools, including a 24-in. back geared shaper, a medium sized emery wheel stand with countershaft, milling machine, 30-in. back geared drill press, engine lathe with 24-in. swing, boring and turning mill with 76-in. swing and engine lathe with 24-in. swings.

The plant of the Eureka Springs Electric Light & Power Company, Eureka Springs, Ark., has been purchased by the Fidelity Trust Company of that city.

An electric light plant, to cost \$75,000, will be erected by the city of Colquitt, Ga. P. E. Wilkin is Mayor.

A 150-ft. dam is to be built at Cartersville, Ga., by the Blue Ridge Power Company for the development of 30,000 hp. for transmission by electricity. William A. Carlisle, Gainesville, Ga., is interested.

The capacity of the plant of the Union Phosphate Company, Union City, Ga., will be doubled by the installation of additional equipment. J. G. Eubanks is president of the company.

Two new pumps are to be installed in the water works plant at Biloxi, Miss., having capacities of 1500 and 5000 gal. respectively. E. I. Castanera is superintendent.

A sawmill, with machine shop, water system and electric light plant, is to be built at Folwell, Miss., by C. W. Robinson, M. C. Anderson and others. Much of the equipment has been bought.

A foundry is to be established at Stuttgart, Ark., by H. F. Roush and Syarling White, Hillsboro, Ohio.

Forrest City, Ark., has purchased a 115-hp. boiler for installation in the city electric light plant. Other improvements may be made.

The Gulf Machine & Engineering Company, Tampa, Fla., has filed amended articles of incorporation, increasing its capital stock from \$10,000 to \$50,000 and changing its name to the Gulf Iron Works.

Texas

AUSTIN, TEXAS, April 22, 1911.

Crop conditions and prospects in Texas at this time could hardly be improved upon, and the feeling of optimism on the part of all kinds of business interests and the people generally was perhaps never more pronounced in the history of the State. Even the political complexion of State affairs has changed wonderfully in the last few years, and a new policy on the part of the State government toward corporations and financial investments is being practiced. Governor O. B. Colquitt was elected on a platform of fair and liberal treatment of legitimate business interests, was pledged to a policy of "political peace and legislative rest," and is living up to his promises.

A meat packing house and cold storage plant will be installed at Austin by W. B. Walker & Sons and operated in connection with their large canning factory. The proposed improvement will cost about \$100,000.

The Cuero Packing Company has been organized at Cuero, with a capital stock of \$10,000. The incorporators are A. D. Edson, E. C. Hesse and Walter Reiffert.

A 14,000-gal. tank is being erected at Runge for the water works system that is owned by Carl Mueller. He is also making other improvements to the plant and distributing system.

Machine shops will be installed at Port Aransas by R. P. Bracht.

The Gulf Coast Drilling Company, San Antonio, has been organized for the purpose of constructing, maintaining and operating dams, reservoirs, canals and irrigation plants. It has a capital stock of \$10,000. The incorporators are I. N. Bettison, M. J. Bass and H. G. Egli.

C. Q. Horton, Austin, has been awarded the contract for the construction of a steel bridge across Elm Creek in Milam County for \$1350.

The Missouri, Kansas & Texas Railroad Company has adopted plans for new shops that it will build at Greenville.

Preparations are being made by the Mission Land & Improvement Company to build an electric light and power plant and complete water works system at Mission. It also has under consideration the installation of an ice and pre-cooling plant.

L. K. Laursen, Memphis, Tenn., will erect a factory at

San Antonio for the manufacture of office furniture, store fixtures, stairways and wainscotings. He has purchased a site for the proposed plant.

The L. Frank Saddlery Company contemplates enlarging its factory at San Antonio.

The Alamo Iron Works, which recently finished the erection of a planing mill and carpenter shop at San Antonio, will also install a large amount of new machinery in its shops.

The Kohlberg Cigar Company, El Paso, will erect a four-story factory building there.

The Tyler Turpentine Company, which was recently organized at Colmesneil, with a capital stock of \$10,000, will install a turpentine distilling plant near that place. The incorporators are S. S. Day, W. H. Day and E. C. Ballintine.

The pickling station of the Price-Booker Company, San Antonio, situated at Rock Island, is to be enlarged.

A new cotton gin is being installed at Edgar Station by W. C. Perry and associates.

J. C. Merritt of Concrete is erecting a cotton gin at Cheapsid, Texas.

The Rosebud Compress Company has been organized at Rosebud, with a capital stock of \$20,000. The incorporators are Ben Loewenstein, E. C. Schmidt and George Roper.

C. E. Race, Los Angeles, Cal., and associates are preparing to develop extensive tracts of land that they own near Ensenada, Lower California, Mexico. Besides establishing different kinds of industrial plants, they will erect large wharves and other port improvements at Ensenada. It is stated that more than \$1,000,000 will be invested in the enterprise.

David E. Thompson, Lincoln, Neb., former United States Ambassador to Mexico, is at the head of an American syndicate that is preparing to erect several large factories in the States of Guanajuato and Jalisco, Mexico, for the manufacture of crude rubber from the palo amarillo tree. It is announced that the syndicate will invest several million dollars in the new industry.

The city of Terrell has issued \$12,000 of bonds for boring artesian wells.

The Briggs-Weaver Machinery Company, Dallas, has been awarded the contract for the erection of the new electric light station at Coleman.

The Big Bend Mining Company will install a new furnace and make other extensive improvements at its quick-silver mines near Terlingua. It is building a brickmaking plant for the purpose of manufacturing about 250,000 brick for its own use. The general offices of the company are at Dallas.

John Faulkner, Hutchinson, Kan., will install a 15-ton ice factory at Portales, N. M.

The Hammond-Farmington Canal Company, which was recently organized at Sante Fé, N. M., with a capital stock of \$250,000 will construct an extensive system of irrigation in the valley of the San Juan River in San Juan County, N. M.

Ralph E. Hoskat, Dayton, Ohio, and associates are promoting the construction of an electric street railroad system in Palestine, Texas.

The City Council of Austin will soon submit to a vote of the people of this city several pending propositions for the reconstruction of the big dam across the Colorado River here and the installation of a hydroelectric plant. None of these propositions involves a bond issue on the part of the city. It is planned that the enterprise shall be carried out and maintained by private interests for a period of years, and that the city shall pay for improvements in semiannual installments from the receipts of the municipal water and light plants. It is expected that the cost of the dam and hydroelectric plant will be in the neighborhood of \$1,000,000.

The system of irrigation of the American Rio Grande Land & Irrigation Company in the lower valley of the Rio Grande in Texas is to be greatly enlarged, so as to bring about the reclamation of about 30,000 acres in addition to the 35,000 acres that are now irrigated by this canal system. The company's office is at Mercedes.

The Citizens Light & Power Company, Wichita Falls, has been granted a franchise for the installation of an electric light plant, work upon the installation of which has already been commenced.

The Alvin Ice, Light & Power Company, Alvin, recently incorporated with \$15,000 capital stock, has taken over an existing plant, the capacity of which will be greatly increased. The company will install a water works system in the town and will be in the market for considerable material.

The Ennis Ice, Light & Power Company, Ennis, will install additional icemaking machinery.

The city of Rogers will install a modern water system. Brick buildings are now in the course of construction, covering a space of 115 x 380 ft.

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The city of Snyder will install a water works system with the proceeds of the sale of \$44,000 water works and sewerage bonds.

It is reported that a large Boston manufacturer of fire-works will establish a branch factory at Houston for the manufacture of the company's products.

W. C. Williams of Oklahoma is arranging to establish at Houston a construction company to engage in handling and installing heavy machinery.

The Gonzales Ice & Refrigerator Company, Gonzales, is making considerable improvements to its plant. New ammonia condensers and freezing tank will be added.

The Desert Gold Machine Company, Canton, has been incorporated, with a capital stock of \$25,000. The incorporators are A. C. Frazier, D. M. Owings, W. M. Osborne and E. C. Frazier.

The Pacific Coast

SAN FRANCISCO, CAL., April 19, 1911.

There is a little more stir in the California machine tool market and the present movement is fully normal, as judged by the standards of the last few years. Some dealers note a very marked improvement in the last two months and state that recent sales have been larger than for any similar period in nearly four years. The larger oil interests, most of which maintain well equipped shops, are now among the principal buyers, though general development work in the interior is beginning to have its effect on the market, and inquiries have recently been received from many shops in outside towns. Few orders are for more than one or two tools, but much of the equipment sold this month has been of comparatively large size for this territory, and as a rule immediate delivery is desired. There is a prospect of some fairly good railroad business in the near future.

The demand for woodworking equipment is irregular and much of the business is on second-hand machinery. This market was well filled up with woodworking machinery in the latter part of 1906 and only the larger, up-to-date mills are buying many new machines. Second-hand machinery of all descriptions finds a fair demand, though in most lines the supply is large.

Owing to an eight-hour female labor law, which takes effect May 22, several local laundries are increasing their plants. New six-roll mangles are being installed by the Metropolitan and Mercantile laundries, and the latter has just installed a pump of about 7000 gal. per hour capacity.

The Geo. E. Dow Pumping Engine Company is making several pump cylinders of cast steel for 600 lb. working pressure. The castings were made by the Columbia Steel Company and are the first of the kind ever machined on the coast for such heavy duty. The Dow Company has taken an order from the Cia. de Aguas de Santa Ana, Salvador, C. A., for two 11 x 12 in. horizontal duplex piston pumps, direct connected to two 40-hp. motors, to work against a head of about 1500 ft.

The Oliver Continuous Filter Company, San Francisco, is building cyanide filter outfits for the Nevada Wonder Mining Company, Wonder, Nev.; the Candelaria Consolidated Mining Company, San Dimas, Durango, Mexico; the Maricopa Mines Company, Austin, Nev., and the Cia. Minera Jesus Maria y Anexas, San Jose de Gracia, Sinaloa, Mexico.

H. L. Terwilliger has been appointed vice-president of Harron, Rickard & McCone, local machinery merchants, succeeding the late Thomas Rickard.

A. S. Kalenborn and A. J. Pahl have opened a machine shop and office at 37 Stevenson street. They will specialize on engineering work in connection with pumping plants, &c.

The sum of \$42,000 has been set aside for the extension of the building slip crane runway at the Mare Island, Cal., Navy Yard.

The shops of the Southern Pacific Railroad at Sacramento, Cal., which greatly curtailed operations a few days ago, are again running full time, and the Oakland shops are running on a larger scale than for some time past. It is reported that the company will make a number of improvements in the Sacramento plant, the principal item being a new foundry of double the capacity of that now in use. It is also reported that the Santa Fé Railroad will put in a machine shop at Fresno, Cal. An inquiry is expected shortly for an addition to the Southern Pacific shops at Los Angeles.

The Jackson-Church Pump Works has been incorporated at Los Angeles, with a capital stock of \$100,000, by S. B. Church, F. H. Jackson, T. S. Smith, A. J. Sherer and C. J. Walker.

The W. D. Hall Company, dealer in mill and shop supplies, has been incorporated at El Cajon, Cal., with a capital stock of \$100,000, by W. D. Hall, O. B. Avis, E. Dickson, L. T. Meacham and S. C. Hall.

The W. G. Augustine Foundry & Mfg. Company has been incorporated at Los Angeles, with a capital stock of \$50,000, by W. G. Augustine, J. E. and J. G. Hoyal, M. and L. M. Augustine.

The Pacific Corrugated Pipe Company has been incorporated at Los Angeles, with a capital stock of \$25,000, by G. B. Doak, H. E. and F. M. Teter.

The Midway Equipment Company, handling oil well supplies, has been incorporated at Bakersfield, Cal., with a capital stock of \$25,000, by Fred Marsh, F. R. Camp, W. W. Stephenson, C. M. Dunham and H. G. Moss.

O. H. Rogers, formerly of the Rogers & D'Artenay Mfg. Company, is contemplating the establishment of an implement factory near Lodi, Cal.

The Santa Fé Railroad is preparing to install a welding plant in connection with its shop at San Bernardino, Cal.

The Southern California Edison Company is taking bids on the second unit of its plant at Long Beach, Cal., the capacity of which will be about 20,000 hp. The first unit is expected to be in operation by July 1.

The Covina Irrigating Company, Covina, Cal., has placed a contract with the H. N. Tracy Company for the installation of a pumping plant near Irwindale, at a cost of \$38,452.

The United Engineering Works, Oakland, Cal., has taken a contract for a municipal pumping plant for Santa Cruz.

The Mare Island Navy Yard is making estimates on the installation of turbine engines in the navy tug Iroquois.

A pump of 200 gal. per minute capacity, with a head of 2000 ft., is being installed at the Brunswick mine, near Grass Valley, Cal.

The Western Engineering Company, Los Angeles, Cal., has taken a contract for equipping the Third Street Railway in that city with the American differential railroad axle device. A similar installation is being made for the Kahului Railroad in the Hawaiian Islands.

The Kern River Oilfields of California, Ltd., is installing an electric motor system for drilling and pumping on its property in the Kern River district. About 200 motors are being used.

The Braden Mfg. Company, Hanford, Cal., is selling a large number of irrigation pumps, which are operated by Westinghouse motors of 2 to 10 hp.

The Hansborough Bros. Company, which has a large contract for work on the Oakland quay wall, has purchased a No. 4 McCully crusher and other equipment for installation at Point Richmond, on San Francisco Bay.

The San Francisco Supervisors have practically decided on a site for the power house for the Geary street municipal railroad.

The Los Angeles Brass Works and the Liebfried Brass Mfg. Company, both of Los Angeles, Cal., have been consolidated under the name of the Los Angeles Brass Mfg. Company, with a capital stock of \$25,000. The plant is at 711-713 North Main street. Those principally interested are F. Rice, L. R. Raymond, D. T. Mason and L. W. Swarts. The plant has a daily melting capacity of 3000 lb., using oil fuel.

A lot of new machinery has been ordered for the laundry of Hotel Del Monte, near Monterey, Cal.

The West Side Lumber Company, Tuolumne, Cal., has installed an 800-hp. steam turbine, in addition to a lot of new mill equipment.

Fairbanks, Morse & Co. have taken a contract for a water works pumping plant for the town of Ontario, Cal., at \$17,311.

An Oakland shop has a contract for machinery for a new steam schooner for the S. S. Freeman Company, San Francisco, the hull for which is being built at Aberdeen, Wash.

The Yosemite Power Company has acquired the property of the Tuolumne River Power Company, including numerous water rights, power sites, &c., and it is reported that work will soon be commenced on the development of the project.

The Temescal Clay Products Company, Los Angeles, Cal., will commence work in the near future on its plant to be erected on a 16-acre site in the southeast industrial district of Los Angeles. The plant was designed by the American Clay Working Machinery Company, Bucyrus, Ohio, and will represent an investment of \$135,000. The main factory building will be a frame structure covered with corrugated iron, 180 x 360 ft., three stories. The company is incorporated with \$1,000,000 capital stock.

Baker City, Ore., has voted bonds for the construction of water works system and electric light plant, work upon which will be commenced at once.

The Washington-Oregon Corporation, 1311 Yeon Building, Portland, Ore., will erect a large power plant on Coal Creek.

The Idaho Electric Mfg. Company, Pocatello, Idaho, has been organized to manufacture an electric range invented by John A. Tupper.

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Eastern Canada

TORONTO, ONT., April 22, 1911.

Actual business is generally good and prospective business has a still better appearance. Immigration is larger than ever before and, on the whole, of superior economic quality, the great mass of newcomers being young, industrious, thrifty, with considerable resources and bent principally upon farming. It is expected that the immigrants of this year will be not much less than twice as numerous as those of last year. With so many more added to the farming population, and with weather conditions by no means adverse, there is good reason to expect a decided expansion of the area under crop, and therefore to look forward to an enlarged agricultural yield. In their monthly statement to the Government the banks show that their financial assistance to business is not stinted, there being a marked increase in commercial loans. Business in the West is reported to be particularly brisk and healthy. The land companies there have all raised their prices.

Under the Canadian companies act letters patent have been issued incorporating Henry R. Towne, New York; John H. Towne, New York; Walter C. Allen, Stamford, Conn.; John B. Milliken, Montclair, N. J., and L. H. Porter, Stamford, Conn., as the Canadian Yale & Towne, Ltd., with a capital stock of \$100,000, the chief place of business to be at St. Catharines, Ont. It is to engage in the business of making safes, safe locks, hinges and locks of all kinds, &c. It is announced from St. Catharines that this Canadian offshoot of the Yale & Towne Mfg. Company, Stamford, Conn., will employ about 200 hands. The city is to give a free site of 10 acres, to exempt the company's plant from taxation for 10 years and for a further five years give a fixed assessment. The agreement is to be submitted to the ratepayers. The company is to spend at least \$50,000 on buildings and machinery.

At a mass meeting of the citizens of Ridgeway, Ont., it was unanimously decided that the town should install a water works system. The estimated cost is \$35,000.

A by-law is to be submitted to the ratepayers of Owen Sound, Ont., on May 6, to ratify an agreement with C. S. Lloyd, Toronto, who undertakes to establish a children's vehicles factory in the town to cost \$50,000. On its part, the town is to lend him \$25,000 for 25 years at 4½ per cent.

The United Engineering Company, with a capital stock of \$1,000,000 and head office at Toronto, has been incorporated under Dominion laws.

The International Milling Company, with a capital stock of \$6,000,000 and head office at Toronto, has been incorporated as a Dominion company.

The Naseo Company, with a capital stock of \$100,000 and head office at Toronto, has been incorporated as a Dominion company to carry on business in the manufacture and sale of electrical machinery, &c.

The Martin Bennett Asbestos Mines, Ltd., with a capital stock of \$1,500,000, has been incorporated under Dominion laws. The head office of the company is to be at Thetford Mines, Que.

The Holeproof Company has been incorporated to carry on business at London, Ont., to manufacture hosiery, &c. Geo. M. Reid and F. F. Harper are London capitalists interested.

The Galt Brass Company, Galt, Ont., is about to enlarge its plant and put in some new machinery.

Western Canada

WINNIPEG, MAN., April 22, 1911.

The new blast furnace lighted at the steel plant of the Lake Superior Corporation, Sault Ste. Marie, Ont., last week, is of 500 tons daily capacity.

The Ladysmith Collieries, Ltd., has just been incorporated, with a capital stock of \$3,000,000. Its mines are on the outskirts of Ladysmith, B. C., which city is to be the company's headquarters for the time being.

The *News-Advertiser* of Vancouver, B. C., stated in its issue of April 16 that A. P. Gillies, who is connected with the promotion of the British Columbia Steel Corporation, promises that the construction of bar and tube mills to cost \$700,000 will be begun at Port Mann this summer. Next will follow blast furnaces, a rail mill and a structural steel mill, whose construction is expected to begin in about eight months. Mr. Gillies said that his mission was for the location of the site at Port Mann. It is reported to have spoken, in part, as follows: "Construction work will be under the direction of the United Engineering & Foundry Company, Pittsburgh. This company has already prepared all the estimates, plans and specifications. Associated with me are Charles P. Taft, a brother of the President of the

United States; Henry Hewitt, a Tacoma millionaire, and L. O. Heddon of New York."

Benjamin Ward, an American, has purchased 189 acres of land near Saskatoon, Sask., on which it is proposed to build a plant for the manufacture of flax binder twine and other flax products. The nail binder attachment is also to be made. Minneapolis men are said to be associated with him in the enterprise.

The Canadian Fish & Cold Storage Company of British Columbia has begun the construction at Prince Rupert, B. C., of a plant that is to cost \$350,000 and is to be completed by next March.

The Tofield Coal Company, Edmonton, Alberta, proposes to develop and operate its mines by machinery. Its manager, Charles Taylor, has returned from Europe, where he purchased a land dredge, said to be the only machine of its kind on this side of the Atlantic. It is to remove the layer of earth lying on the coal deposit. Other modern machinery has been purchased by the company for operations to begin in June.

The B. C. Telephone Company, Vancouver, has improvement and extension projects in hand that will call for the expenditure of \$1,000,000 this year.

The Power Specialty Company, 111 Broadway, New York, reports among recent contracts secured for Foster superheaters the following: Cleveland Electric Illuminating Company, 9162 hp. in Stirling boilers; Cleveland, Cincinnati, Chicago & St. Louis Railroad, 1548 hp. in Stirling boilers; Solvay Process Company, Detroit, 5400 hp. in Babcock & Wilcox boilers; Milwaukee Electric Railway Company, 6000 hp. in Edge Moor boilers; Winnipeg Electric Railway Company, 7500 hp. in Babcock & Wilcox boilers; New York, New Haven & Hartford Railroad Company, Waterbury, and Zylonite plants, 6000 hp. in Bigelow-Hornsby boilers; Stone & Webster in the plants of the Minneapolis General Electric Company, Jacksonville Electric Light Corporation, El Paso Electric Railway Company, 9450 hp. in Babcock & Wilcox boilers. With one exception, these contracts are all from previous users of Foster superheaters, and in many cases represent from the fifth to the fifteenth repeat order.

John J. McNamara, secretary-treasurer of the International Association of Bridge and Structural Iron Workers; James McNamara, his brother, and Ortie E. McNamara, a member of the Chicago branch of the association, have been arrested and taken to Los Angeles, Cal., charged with the blowing up of the *Times* Building, in that city, October 1, 1910, when 21 lives were lost. The officers making the arrests state that they have conclusive evidence of the guilt of the prisoners and of their connection with a very large number of the 70 or more dynamitings of nonunion structural steel work in the past five years.

The Columbus Iron & Steel Company, Columbus, Ohio, in a recent leaflet, refers to its Buckeye sandless pig iron for foundry use. This iron is cast in iron molds and is allowed to cool very slowly. The fracture is but little affected and the analysis is unchanged. Emphasis is put on the fact that sandless iron melts more quickly and with less coke than sand cast iron. Concerning the material required to make a ton of pig iron the leaflet gives this: Iron ore, 2 tons; coke, 1.1 tons; limestone, 0.6 ton; total, 3.7 tons. In addition it requires 5 tons of air per ton of pig iron to burn coke and 42.5 tons of water for cooling purposes.

A. M. Byers & Co., Inc., with general offices in Pittsburgh, and pipe mills on the South Side, Pittsburgh, will on May 1 have its new plate mill at Girard, Ohio, ready for operation. The mill is 26 x 76 in., two-high roughing and three-high finishing, with electrically driven tables. It will be driven by a 30 x 60 in. Wisconsin-Corliss engine, and its output will be lap weld pipe skelp for 4 to 12 in. pipe, inclusive. The plate mill building is 102 x 281 ft., of steel construction, and is laid out along modern lines.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL— Bar Iron from store—

Refined Iron:	
1 to 1½ in. round and square.....	\$ 1.75c
1½ to 4 in. x ½ to 1 in.....	\$ 1.85c
1½ to 4 in. x ½ to 1 in.....	\$ 1.85c
Rods—½ and 11-16 round and square.....	\$ 1.85c
Angles:	
3 in. x ½ in. and larger.....	\$ 2.00c
3 in. x 8-16 in. and ½ in.....	\$ 2.25c
1½ to 2½ in. x ½ in.....	\$ 2.10c
1½ to 2½ in. x 3-16 in. and thicker.....	\$ 2.00c
1 to 1½ in. x 3-16 in.....	\$ 2.10c
1 to 1½ in. x ½ in.....	\$ 2.20c
¾ x ½ in.....	\$ 2.30c
¾ x ½ in.....	\$ 2.40c
¾ x ½ in.....	\$ 2.45c
¾ x 3-32 in.....	\$ 2.50c
Tees:	
1 in.....	\$ 2.65c
1½ in.....	\$ 2.45c
1½ to 2½ x ½ in.....	\$ 2.15c
1½ to 2½ x 3-16 in.....	\$ 2.35c
3 in. and larger.....	\$ 2.05c
Beams.....	
Channels, 3 in. and larger.....	\$ 2.00c
Rails—1½ to 6 x 3-16 to No. 8.....	\$ 2.30c
"Barden's Best" Iron, base price.....	\$ 1.50c
Barden's "H. B. & S." Iron, base price.....	\$ 2.95c
Norway Bars.....	\$ 3.00c

Merchant Steel from Store—

Bessemer Machinery.....	per lb. \$ 1.90c
Toe Calk, Tire and Sleigh Shoe.....	\$ 2.50c to \$ 3.00c
Best Cast Steel, base price in small lots.....	\$ 7c

Sheets from Store— Black

	One Pass, C.R.	R. G.
	Soft Steel	Cleaned.
No. 16.....	\$ 2.50c	\$ 2.80c
Nos. 18 to 20.....	\$ 2.70c	\$ 2.90c
Nos. 22 and 24.....	\$ 2.75c	\$ 3.00c
No. 26.....	\$ 2.80c	\$ 3.10c
No. 28.....	\$ 2.90c	\$ 3.20c

Russia, Planished, &c.

Genuine Russia, according to assort- ment.....	\$ 12 @ 14½c
Patent Planished, W. Dewees Wood, per lb. A, 10c; B, 9c net.	

Galvanized.

Nos. 12 and 14.....	\$ 2.25c
Nos. 22 to 24.....	\$ 3.30c
No. 26.....	\$ 3.50c
No. 28.....	\$ 3.80c
No. 20 and lighter 36 inches wide, 25c higher	

Genuine Iron Sheets— Galvanized.

Nos. 22 and 24.....	\$ 5.75c
No. 26.....	\$ 6.25c
No. 28.....	\$ 7.25c

Corrugated Roofing—

	2½ in. corrugated.	Painted	Galv.
No. 24.....	\$ 100 sq. ft. \$3.55	4.30	
No. 26.....	\$ 100 sq. ft. 3.55	4.00	
No. 28.....	\$ 100 sq. ft. 2.60	3.75	

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
1C, 14 x 20.....	\$ 6.65
1X, 14 x 20.....	7.90
A. Charcoal:	
1C, 14 x 20.....	\$ 5.60
1X, 14 x 20.....	5.70

American Coke Plates—Bessemer—

1C, 14 x 20.....	\$ 4.50
1X, 14 x 20.....	5.50

American Terne Plates—

1C, 20 x 28 with an 8 lb. coating.....	\$ 5.70
1X, 20 x 28 with an 8 lb. coating.....	10.70

Seamless Brass Tubes—

List November 11, 1908.....	Base price 18c
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Brass Tubes, Iron Pipe Sizes—

List November 13, 1908.....	Base price 18c
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Copper Tubes—

List November 13, 1908.....	Base price 21c
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Brazed Brass Tubes—

List February 1, 1911.....	10½c per lb.
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High Brass Rods—

List February 1, 1911.....	14½c per lb.
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Roll and Sheet Brass—

List February 1, 1911.....	14½c per lb.
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Brass Wire—

List February 1, 1911.....	14½c per lb.
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Copper Wire—

Base Price.....	Carlond lots mill 15½c
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Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) per lb. 18c	
Sheet Copper Cold Rolled, 16 oz advance over Hot Rolled.	
Sheet Copper Polished 20 in. wide and under, 16 square foot	
Sheet Copper Polished over 20 in. wide, 26 square foot	
Planished Copper, 16 square foot more than Polished.	

METALS— Tin—

Straits Pig.....	\$ 2.45
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Copper—

Lake Ingot.....	\$ 1.14
Electrolytic.....	\$ 1.15
Castings.....	\$ 1.16

Spelter—

Western.....	\$ 0.40
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Zinc.

No. 9, base, casks....	\$ 0.80
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Lead.

American Pig.....	\$ 0.10
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Solder.

½ & ¾, guaranteed.....	\$ 0.25
No. 1.....	\$ 0.25
Refined.....	\$ 0.25
Prices of solder indicated by private brand vary according to composition.	

Antimony—

Cookson.....	\$ 0.25
Hallett.....	\$ 0.25
Other Brands.....	\$ 0.25

Bismuth—

Per lb.....	\$ 2.00
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Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting.....	\$ 0.25
Rods & Wire.....	Base Price 10c
Sheets.....	Base Price 12c

Old Metals.

Dealers' Purchasing Prices Paid in New York

Copper, Heavy cut and crucible.....	\$ 10.75 @ 11.00
Copper, Heavy and Wire.....	\$ 10.50 @ 10.75
Copper, Light and Bottoms.....	\$ 9.50 @ 9.75
Brass, Heavy.....	\$ 7.00 @ 7.25
Brass, Light.....	\$ 6.00 @ 6.25
Heavy Machine Composition.....	\$ 9.25 @ 9.50
Clean Brass Turnings.....	\$ 7.00 @ 7.25
Composition Turnings.....	\$ 8.00 @ 8.25
Lead, Heavy.....	\$ 1.75
Lead, Tea.....	\$ 1.50
Zinc Scrap.....	\$ 0.40

NICHOLSON

We have had over forty years' experience in making Files and Rasps; we not only know what KIND of steel to use, but HOW to use it.

If NICHOLSON FILES did not hold their CUTTING edge—our order books would not hold so many CUSTOMERS.

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NICHOLSON FILE COMPANY

PROVIDENCE, R. I., U. S. A.

